

We're glad to be back!

FOLLOWING the reinstatement by IPC of National Union of Journalist members, all of whom had been dismissed in the course of annual pay negotiations, Computer Weekly is once again able to provide readers and advertisers with its comprehensive service of news, information and advertising.

We have continued to cover the computer scene during the past few weeks and this issue contains reports on some of the more important events. Rory Johnston and Tim Palmer found plenty of interesting developments at Hannover Fair and their round-up of the show is given on pages 26 and 27. Later, Palmer joined Keith Jones at Anaheim, California, for the big US event, the National Computer Conference. Their reports and pictures are on pages 14 and 15.

There is also a review of Communications 80 by Donald Kennett on page 18, and all computer athletes will be keen to see the line-up for the finals of Computesters 80. Reports and pictures from all the heats are given on pages 24 and 25.

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PRIZE CROSSWORD NO. 5 - PAGE 64

Unions threaten 'Luddite' approach

THE government must accept responsibility for growing unemployment and protect the economy from the further unemployment threatened by new technology.

If it fails to do so, the unions will adopt a "Luddite" approach to the new technology and that would have a disastrous and far-reaching effect on the economy.

This warning was given last week by Terry Molloy, assistant secretary of the Banking, Insurance and Finance Union.

Addressing delegates at Infotech's conference on the automated operator, he said: "The government must defend the economy against technological unemployment; stimulate the adoption of new technology; increase the flow of skilled manpower into the computer industry; encourage agreements between trade unions and employers and provide retraining."

Molloy said the unions in general are in favour of new technology but find themselves "on the horns of a dilemma".

He explained: "If the unions oppose new technology, the economy will suffer and the result will be unemployment. On the other hand, if the unions co-operate and support the introduction of further automation, technological unemployment will result unless it is properly planned."

IBM rushes ahead with H

WORK on IBM's first model in its long-awaited H-series is being pushed ahead hard to achieve an autumn launch. This may be because other manufacturers, notably Amdahl and National Advanced Systems, have machines for the same market slot ready to go.

The IBM machine, code named Hickory, is understood to be a 9 to 12 million instructions per second system, using two processors with an aggregate channel data rate of 100 Mbytes per second. Amdahl's V8 model, a single processor system, has a rating of 8 MIPS as has the Hitachi-built AS/8-7034 introduced by IteI a year ago and due to be relaunched soon by National Advanced Systems (see page 12).

Commenting on these developments, New York consultant Bob Fertig said IBM had more than a dozen Hickories running and "they are training people like mad" to be ready for a launch before the end of the year.

"It could come in the third or fourth quarter if the key element of getting yields up on the logic board sub-assembly can be solved," said Fertig.

Commenting on reports that there may also be a 3034 on the way, Fertig said: "I would call it a stretched 3033. If manufacturing problems on the Hickory cannot be solved in time, I expect IBM to announce the Coronado — formerly the Whitney — disc drive with 2.4 gigabytes in a dual disc package, attachable to the 3033-N. A further field upgrade of the 3033 and a new release of MVS are also on the way."

"The enhanced 3033 will have a larger buffer to increase the throughput from storage, and the key element of the new MVS release will be 32-bit instead of 24-bit addressing so that much larger data volumes can be stored online."

Fertig says that by announcing the Coronado for the 3033-N, IBM would make it attractive for users to convert their rental and lease credits to purchase and wait a couple of years for the Hickory, thus ensuring IBM revenue growth this year.

● Turn to back page



Xerox in optical disc venture

XEROX Corp and Thomson-CSF of France have announced that they are jointly to develop optical disc technology for data processing and office systems. Xerox is already a major OEM supplier of magnetic disc drives through its subsidiaries, Shugart and Century Data Systems.

Magnetic disc drive specialist Memorex has said that it regards optical recorders as the one serious threat to magnetic discs as the leading type of online mass storage device in the foreseeable future. The recording media products side of Memorex is already developing disc media for use with optical recorders.

Phillips has demonstrated a laser based optical data disc drive at its laboratories at Eindhoven in Holland, the drive being able to record 10,000 million bits on the two sides of a 12-inch disc.

Enormous capacities of this sort should make optical discs particularly useful in office systems for recording large numbers of images.

CDC fails to shake Cray

THE advent of Control Data's supercomputer, the Cyber 205, with a claimed maximum speed of 800 million operations per second does not appear to have seriously shaken CDC's main competitor in the supercomputer business, Cray Research.

Cray's president, John R. Cray, told Computer Weekly that Cray had been competing against the Cyber 205 for a year before its official announcement. He believed that the machine ordered from CDC by the Meteorological Office in the UK last year was a 205.

The Cyber 205 supersedes the Cyber 200 announced early last year and the main difference is that the vector processor in the 205 employs high density emitter coupled logic chips.

Rolvagren said that Cray machines barely employed even small scale integration.

£25m for Immos must wait for NEB talks

NO decision on the government's second £25 million investment in Immos will be made while the National Enterprise Board is involved in commercial negotiations on the future of the UK microelectronics venture, the industry Minister Sir Keith Joseph told the Commons on Monday.

Tory MP Timothy Repton had asked when Sir Keith proposed to announce his decision, and suggested that the delay was causing damage to Immos, its employees and British microelectronics as a whole. In his answers the Minister said proposals being considered were commercially confidential and it would be wrong to abort NEB negotiations.

Among those said to be interested in buying out the government's 70% holding in the venture are two US firms and a Belgian consortium.

The NEB's move to sell its 50% holding in Ferranti has attracted about 10 potential buyers. However, within the firm there is a fear that its independence may be lost and it is hoped the NEB would retain at least 20% of its holding, selling the rest to institutional investors.

Pergamon may save Infoline

INFOLINE, the UK's online retrieval service (CW, August 18, 1979), has run short of cash before ever really getting off the ground, but it may be rescued by Robert Maxwell's Pergamon Press. If current talks are successful, Pergamon will take over Infoline, leaving existing shareholders with the option of continuing to play a part.

Infoline has been seriously short of money for some months and customers were warned that it would have to close down its service. This was avoided when the Pergamon rescue became a possibility. The existing shareholders, the Institution of Electrical Engineers, the Chemical Society, the Department of Industry, the British Library and several public bodies were either unable or unwilling to spare more cash to keep the service going.

Infoline runs on a dedicated Olivet 1100 at the GSI bureau.

Yoghourt goes better with chips

"The savings and opportunities provided by the introduction of our new system are enormous." That's the view of Fred Emlynson, Manager of Management Services with Express Dairy Foods. The new distributed processing system is one of the most ambitious in the country — with a total of 27 microcomputers serving 13 factories and 27 distribution depots. It will help Express get more dairy goods — like its Eden Vale products — to the right place at the right time.

Data Logic is implementing the project under a turnkey contract. That means software development, supply of computers and project management. It even, in this case, means the development of special communications hardware based on microprocessors, for a more economic data network and fewer transmission errors.

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Downtime

by Chad

Mind-stretching experience

HANOVER FAIR is ridiculous. What's the point of a show where you have to equip a major expedition to get from one end of the grounds to the other? To say nothing of the native porters you need to carry around the huge catagor-gue and all the bumpy you collect.

Still, it's good occasionally to get one's mind (and one's biceps) stretched. There are nice touches of ingenuity, such as the mode of transport by which one arrives to see all the space-age technology, namely, trains.

Soon, if your calculator is too-deaf you won't have the time to produce it at a board meeting, judging from the racks of the things all whirling away. I thought I was in the Regent's Park aviary, is this the peak of capitalist technological achievements? Apparently so.

Among the range of electronic cash registers, the most ridiculous had to be the one on the Electronic Business Machines stand, which had a moulded plastic case made to look like one of those old ornate brass jobs. They couldn't do much about making the LED display look old, though. Who on earth would want one, I asked. Oh, antique shops, boutiques, said the lady.

The most advanced computer technology was to be found in the Research Hall. The European Space Agency had a mock-up of the laboratory to be sent up in the Space Shuttle, and there among all the equipment what



THE Germans have not yet got into as much whimsy as you find at American fairs, but they are working on it. Take for instance the systems house which exhibited these computer-driven gorillas, mother and daughter. What it was all about I have no idea, since although mother and daughter held a long conversation, it was all Greek to me, being in German. Their conversations were quite impressive, I have to admit.

Sharp's the word

YOU will have noticed that every computer company under the sun is hurriedly joining the OOF Stakes — the race to produce the all-electronic Office Of the Future. The other day a firm, whose name I will withhold to spare its blushes, launched a new organisation to market business systems — and what do you suppose it gave away to the assembled journalists? Its symbol for the paperless Office of the Future — electric pencil sharpeners.

By this I do not mean sharpeners for electric pencils. Mind you in my cynical way I keep saying we're never going to get rid of pencils, so maybe those people have been listening to me.

Meanwhile the electric pencil sharpener has been received warmly on CW's sub-editor's desk, where somewhat to our embarrassment we write about this new new world while only using the most antiquated technology imaginable.

The day after the shar-



MICHELIE'S PRIVATEVIEW

Home truths on our ailing industrial technology



Professor Donald Michie is head of the Machine Intelligence Research Unit at Edinburgh University.

IN a succession of reports, the Cabinet Office's Advisory Council for Applied Research and Development has fired a remarkable salvo of home truths concerning the UK's ailing industrial technology.

ACARD has now done it again: this time not so much responding to the need for renovations as to the opportunity boldly to strike out along a fresh line.

The new ground is genetic engineering, fast becoming a high growth industry in the US. By combining forces with the Advisory Board for the Research Councils and the Royal Society, ACARD has also ensured that something is likely actually to get done.

A sum of £10million over five years is proposed for launching an NEB-backed company. Facilities in universities are to receive £2 million from the University Grants Committee and a minimum of £3 million a year committed by the research councils.

Anticipated pay-offs span the entire field of biochemical manufacture, including new vaccines, anti-cancer agents, animal feedstuffs, means of combating pollution and recycling waste, and other advances. A policy of government-aided "technology push" will gradually be overtaken by "market pull" as biotechnology emerges from the research-dominated pre-development phase into commercially profitable operation.

Even in these stricken times it appears that our government can still get a new technology moving when it wants to. So why in one case, and not in another?

Everyone knows that there is at least one other conspicuous "hot spot" in our applied science landscape. It is no secret that the UK's highest and most consistent rates of growth are in the computing services industry.

The situation here is now poised to go either way — given the right seeding of R & D investment, to dazzling successes.

Otherwise, as a report from Business Industrial Management warns, "developments in other countries will overtake the United Kingdom and the opportunity of establishing a strong competitive industry will have been lost."

Everyone has his own list of sectors ready to yield to determined thrusts. Mine are the following.

● Parallel array processing, with special reference to computer vision, exemplified in ICL's DAP and Michael Duff's CLIP-4, now operational at University College London. These new architectures promise breathtaking speed-ups and, even more important, radical conceptual simplifications of complex domains. Applications of cheap reliable computer vision range from optical inspection of industrial parts and structures to the input and interpretation of diagrams from books and documents.

● Automatic program synthesis. Energetic advance here is a necessity if the industry is not to have its back broken by continued escalation of programmer costs. Ripeness of time has

been adequately guaranteed by preliminary successes. He who now hesitates is lost.

● Expert Systems. The country which first establishes an edge in interactive knowledge bases will be in a fair way to call the shots across the board. Knowledge engineering is like genetic engineering: the principles are relatively simple, the range of applications unlimited. International leadership is still up for grabs.

The UK is currently in possession of the only cheap and portable general-purpose software for such work. But, without the needed follow-up, the balance of opportunity could quickly change.

● Intelligent robots. It seems a feasible proposition to use an expert system to drive an industrial robot, conferring versatility, retrainability and autonomous resourcefulness beyond anything yet seen in automation. Potential relevance to manufacturing technology is obvious. After last year's robotics initiative by the Science Research Council, there could not be a better moment.

How should all this be facilitated? Writing in the magazine New Scientist, George Gallagher-Daggett, an engineer of SRC's Rutherford

Laboratory, has called for "centres of innovation." These would "allow university researchers to join multi-disciplinary teams, involving industry and possibly private inventors as well, without upsetting their promotional prospects. In this environment they would be subject to the stimulus of commercial competition and could devote their efforts to commercialising intellectual concepts arising from fundamental research carried out in universities."

Brave words: Something along these lines could undoubtedly flip the switch to the "on" position. This is, however, not the first time that such proposals have been advanced; ingrained patterns of thought among government administrators must change if they are to time to find fertile soil.

The significance of the news from the biotechnology front is precisely that such patterns do seem at last to be changing. The next year or two may be crucial in showing whether venturesome stirrings are to be allowed to spread.

Donald Michie

FOCUS

A TOP man from IBM's Office, Products Division, Samuel Karlow, advises DP managers to get to grips with word processing technology. Speaking at an ARIPS office automation conference held in Atlanta, Georgia — attended by about 15,000 delegates — he warned that a clear understanding of WP, what it is and what it does, was essential for the DPM. If he or she is to cope with the introduction of these systems in their organisations.

For IBM-watchers, this statement is, perhaps, the clearest indication yet of where the company sees its future growth. It should also be a clear indication to UK DP professionals as to their future role in their own companies. But before we all rush off to enrol at the local university college, note should be taken of where word processing technology sits in the DP landscape.

According to Karlow, there are five ways WP and DP are merging. These include: the ability to produce quality printing for computer-based systems; electronic mail, remote job entry and file storage facilities such as COM.

Getting to grips with word processing

Quite obviously, WP technology is moving on apace. No longer can it be regarded as an advanced level typewriter, the benefits of which appear to be concentrated on producing personally addressed sales missives or long-winded legal documents. Likewise advantages go beyond the ability to line-justify or incorporate a print-style format.

Technology, however, even for the office, does not stand still. Among the more knowledgeable, the term word processing is old hat. It is now referred to as text processing, with the government itself managing CSA Department of Industry Study into the Implications of Text Processing in the UK.

One firm implication is that this UK DP professional will be dragged, however reluctantly, into the office home. The DP patriots could well be trampled

underfoot as TP links are forged. Whether such joint ventures will result in improved office procedures could well be a matter for doubt. The typical company office is far removed from the DP environment. Milk bottles are more prominently displayed than work manuals, umbrella stands are more visible than work rotas, and rubber plants feature more heavily than industry journals and reports.

Organising the office would appear to require more than an injection of WP machines and matching operators. It will need the dedicated alliance of DPM, office manager and TP expert. But there are, of course, the less publicised implications of WP. Will an IBM or Wang WP system interface with an ICL or Honeywell mainframe? Will future DP activities be limited to the hours of 9am to 5pm? Karlow concluded his talk by

suggesting that DP is really only a small subset of word processing. On the basis of what IBM thinks today, the rest of the industry does tomorrow, perhaps an instant course in typing and filing procedures would be appropriate.

10 years ago

From Computer Weekly of June 11, 1970: THE computerised inter-firm accounting project, IFAC, planned by the Stock Exchange, has run into serious problems, and stage two has been deferred until 1971. A network of centres specialising in DP sales and support is to be established by British Olivetti. ICL won its biggest order in SE Asia with a £280,000 1804A system for the Hong Kong and Chinese universities in Hong Kong.

Strong pound hits ICL's profits plan

A HICCUP in pre-tax profit growth was the only significant setback in another set of strong first-half figures from ICL. Turnover growth remained on target at 21%, but pre-tax profit rose only 10%. The relative decline is attributed primarily to squeezed margins in ICL's overseas subsidiaries because of the relative rise in the value of sterling.

A favourable tax position put after-tax profits up 29% at £16.3 million, but ICL has charged the full estimated cost of the Dukinfield feeder plant closure to profits in the half, reducing this figure by £7.7 million to £8.6 million.

Half-year turnover of £346.3 million keeps the company on target for full year turnover of about £780 million and pre-tax profits, usually better in the second half, of about £52 million.

Because of the rise in sterling's value against most foreign currencies, ICL's foreign business is declining as a proportion of the total, and is now down to

42%-43% of the total compared with 50% 18 months ago.

● The House of Commons Public Accounts Committee has realised that the terms of the £40 million government loan contribution to the development of ICL's 2800 series made it certain that ICL would never have to

repay more than a small fraction of the sum. The committee still hopes that ICL will make a repayment in 1983-84, the final year in which it is required to do so. Repayments only have to be made when pre-tax profits exceed 7.5% of turnover, to a maximum of 25% of the pre-tax figure.

Jacquard cuts back UK sales operations

TWO UK offices have been closed and 18 sales staff sacked by AM Jacquard, maker of combined word and data processing equipment. The company says direct sales business has been lower than planned and the cut-backs are to bring staffing levels into line with this. Sales via distributors have been "on target" though.

The whole direct sales operation in West Germany has also been closed, while the more profitable one in France is unchanged. The UK company has been left with offices in London and Birmingham, losing Manchester and Southampton.

The decision emanated from corporate headquarters in Santa Monica, California. The company was bought only 18 months ago by AM International, formerly Addressograph-Multigraph.

The cuts come only three weeks after Jacquard introduced the AMtext 425 word processor into the UK. This is a stand-alone machine aimed at printers and the in-house reprographics market, and was going to be sold entirely through direct sales. However, the marketing manager for the 425, Jeff Yallop, is one of those sacked. He is intending to set up his own firm to sell the machine.

Those made redundant are all sales or software support staff. In the company's view this should not affect existing customers. Prior to the arrival of the 425, Jacquard had two products,

both combined word and data processors, one shared-logic, the other stand-alone.

The 425 has a full-page screen and facilities for converting text for typesetting, without rekeyboarding. The text is taken from the 425 on a floppy disc and loaded into an AM phototypesetter. The word processor can also handle parallel columns of text, as well as figures.

New products scarce at WP show

A SCARCITY of new products, and attendance hardly increased over 1979, were dominant features of the International Word Processing Exhibition at Wembley. Attendance at the accompanying conference was also low, but some exhibitors said that the seriousness and importance of the visitors was an improvement on past shows.

A stand-alone word processor called Omega was introduced by Computecorp, the Californian maker of small business systems. DP applications software can be swapped in when desired, and a full-page screen is an option.

A clusturable stand-alone called the FD-88 was launched by Supertyping as a replacement for its FD-85. The basic language can be loaded for DP work, and hard cartridge discs are available.

UK users had their first glimpse of the Gyx electronic typewriter, along with Videon on the Exxon Enterprises stand, and the Multiplex, the AES shared-logic system (CW, November 8, 1979).

Eire goes for US software houses

THE US software supplier Turnkey Systems Inc is to set up a software development operation in Dublin following an agreement with the Industrial Development Authority of Eire. This is part of the IDA's thrust into software.

TSI is a wholly owned subsidiary of National CSS of Connecticut and is best known for the telecommunications monitor Task/Master. The product will be marketed and enhanced from the Dublin centre, which will provide 70 jobs. The company has also set up in France and West Germany.

Another US company to establish an Irish base under the IDA's favourable tax concessions is Apple Computers, which plans to manufacture Apple II and III systems and peripherals at a plant in Cork. Apple's plans mean 150 jobs by Christmas followed by another 1,400 later.

Intel is also reported to be looking at Eire, and the chances of its setting up a plant there are "more than likely". "We are now making a thrust into the software industry," said Jerry Kelly, manager of the IDA's service division.

"As a people-intensive business it will benefit from the large supply of graduates — there are 19,000 student places for electronics and computer sciences planned for the next five years." He added "It is also a capital-intensive business, and the freedom from tax will allow 100% of earnings to be ploughed back into development."

DG results

SECOND quarter figures for March 15 for Data General show a profit up about 4% at \$12.7 million on turnover up 30% at \$146.7 million. Profits continue to be depressed by the cost of expanding the services network, which reported business up 60% at \$23.5 million.

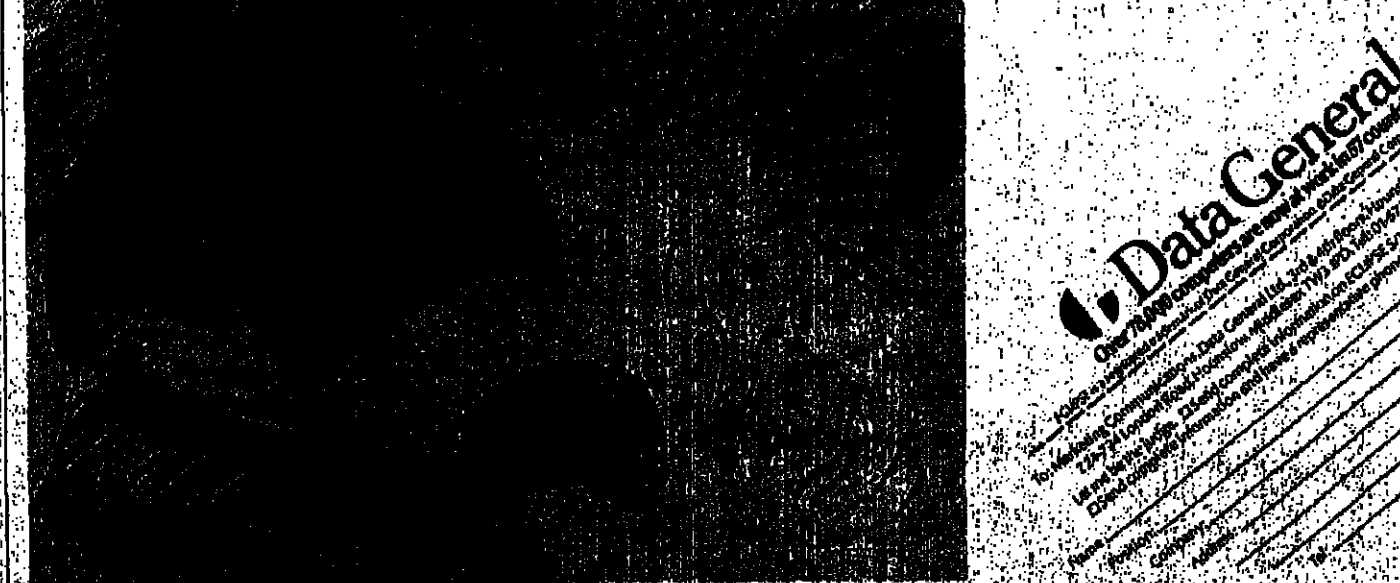
German turnover

WITH turnover up only 4.4% at DM 6,593 million (£1,885 million) IBM Germany has now reported that profit on this was down 25% on 1978 at DM 448 million (£112 million). Disposal of share investments to finance capital spending contributed to the profit fall.

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London Stock Exchange		Pence		New York Stock Exchange		\$		
Price	Stock	Price	Change	Price	Stock	Price	Change	
1980								
High	Low	High	Low	High	Low			
326	326	315	5	1975	1941	Am International	1/4	12
328	328	316	4	2000	1966	Amper	1/2	12
329	329	317	1/2	2078	2044	Automatic Data Pric	1/2	12
330	330	318	1/2	2100	2066	Bankers	1/2	12
331	331	319	1/2	2120	2086	Comstock Scientific	1/2	12
332	332	320	1/2	2140	2106	Comstock Scientific	1/2	12
333	333	321	1/2	2160	2126	Comstock Scientific	1/2	12
334	334	322	1/2	2180	2146	Comstock Scientific	1/2	12
335	335	323	1/2	2200	2166	Comstock Scientific	1/2	12
336	336	324	1/2	2220	2186	Comstock Scientific	1/2	12
337	337	325	1/2	2240	2206	Comstock Scientific	1/2	12
338	338	326	1/2	2260	2226	Comstock Scientific	1/2	12
339	339	327	1/2	2280	2246	Comstock Scientific	1/2	12
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343	343	331	1/2	2360	2326	Comstock Scientific	1/2	12
344	344	332	1/2	2380	2346	Comstock Scientific	1/2	12
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346	346	334	1/2	2420	2386	Comstock Scientific	1/2	12
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352	352	340	1/2	2540	2506	Comstock Scientific	1/2	12
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359	359	347	1/2	2680	2646	Comstock Scientific	1/2	12
360	360	348	1/2	2700	2666	Comstock Scientific	1/2	12
361	361	349	1/2	2720	2686	Comstock Scientific	1/2	12
362	362	350	1/2	2740	2706	Comstock Scientific	1/2	12
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367	367	355	1/2	2840	2806	Comstock Scientific	1/2	12
368	368	356	1/2	2860	2826	Comstock Scientific	1/2	12
369	369	357	1/2	2880	2846	Comstock Scientific	1/2	12
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371	371	359	1/2	2920	2886	Comstock Scientific	1/2	12
372	372	360	1/2	2940	2906	Comstock Scientific	1/2	12
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376	376	364	1/2	3020	2986	Comstock Scientific	1/2	12
377	377	365	1/2	3040	3006	Comstock Scientific	1/2	12
378	378	366	1/2	3060	3026	Comstock Scientific	1/2	12
379	379	367	1/2	3080	3046	Comstock Scientific	1/2	12
380	380	368	1/2	3100	3066	Comstock Scientific	1/2	12
381	381	369	1/2	3120	3086	Comstock Scientific	1/2	12
382	382	370	1/2	3140	3106	Comstock Scientific	1/2	12
383	383	371	1/2	3160	3126	Comstock Scientific	1/2	12
384	384	372	1/2	3180	3146	Comstock Scientific	1/2	12
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386	386	374	1/2	3220	3186	Comstock Scientific	1/2	12
387	387	375	1/2	3240	3206	Comstock Scientific	1/2	12
388	388	376	1/2	3260	3226	Comstock Scientific	1/2	12
389	389	377	1/2	3280	3246	Comstock Scientific	1/2	12
390	390	378	1/2	3300	3266	Comstock Scientific	1/2	12
391	391	379	1/2	3320	3286	Comstock Scientific	1/2	12
392	392	380	1/2	3340	3306	Comstock Scientific	1/2	12
393	393	381	1/2	3360	3326	Comstock Scientific	1/2	12
394	394	382	1/2	3380	3346	Comstock Scientific	1/2	12
395	395	383	1/2	3400	3366	Comstock Scientific	1/2	12
396	396	384	1/2	3420	3386	Comstock Scientific	1/2	12
397	397	385	1/2	3440	3406	Comstock Scientific	1/2	12
398	398	386	1/2	3460	3426	Comstock Scientific	1/2	12
399	399	387	1/2	3480	3446	Comstock Scientific	1/2	12
400	400	388	1/2	3500	3466	Comstock Scientific	1/2	12
401	401	389	1/2	3520	3486	Comstock Scientific	1/2	12
402	402	390	1/2	3540	3506	Comstock Scientific	1/2	12
403	403	391	1/2	3560	3526	Comstock Scientific	1/2	12
404	404	392	1/2	3580	3546	Comstock Scientific	1/2	12
405	405	393	1/2	3600	3566	Comstock Scientific	1/2	12
406	406	394	1/2	3620	3586	Comstock Scientific	1/2	12
407	407	395	1/2	3640	3606	Comstock Scientific	1/2	12
408	408	396	1/2	3660	3626	Comstock Scientific	1/2	12
409	409	397	1/2	3680	3646	Comstock Scientific	1/2	12
410	410	398	1/2	3700	3666	Comstock Scientific	1/2	12
411	411	399	1/2	3720	3686	Comstock Scientific	1/2	12
412	412	400	1/2	3740	3706	Comstock Scientific	1/2	12
413	413	401	1/2	3760	3726	Comstock Scientific	1/2	12
414	414	402	1/2	3780	3746	Comstock Scientific	1/2	12
415	415	403	1/2	3800	3766	Comstock Scientific	1/2	12
416	416	404	1/2	3820	3786	Comstock Scientific	1/2	12
417	417	405	1/2	3840	3806	Comstock Scientific	1/2	12
418	418	406	1/2	3860	3826	Comstock Scientific	1/2	12
419	419	407	1/2	3880	3846	Comstock Scientific	1/2	12
420	420	408	1/2	3900	3866	Comstock Scientific	1/2	12
421	421	409	1/2	3920	3886	Comstock Scientific	1/2	12
422	422	410	1/2	3940	3906	Comstock Scientific	1/2	12
423	423	411	1/2	3960	3926	Comstock Scientific	1/2	12
424	424	412	1/2	3980	3946	Comstock Scientific	1/2	12
425	425	413	1/2	4000	3966	Comstock Scientific	1/2	12
426	426	414	1/2	4020	3986	Comstock Scientific	1/2	12
427	427	415	1/2	4040	4006	Comstock Scientific	1/2	12
428	428	416	1/2	4060	4026	Comstock Scientific	1/2	12
429	429	417	1/2	4080	4046	Comstock Scientific	1/2	12
430	430	418	1/2	4100	4066	Comstock Scientific	1/2	12
431	431	419	1/2	4120	4086	Comstock Scientific	1/2	12
432	432	420	1/2	4140	4106	Comstock Scientific	1/2	12
433	433	421	1/2	4160	4126	Comstock Scientific	1/2	12
434	434	422	1/2	4180	4146	Comstock Scientific	1/2	12
435	435	423	1/2	4200	4166	Comstock Scientific	1/2	12
436	436	424	1/2	4220	4186	Comstock Scientific	1/2	12
437	437	425	1/2	4240	4206	Comstock Scientific	1/2	12
438	438	426	1/2	4260	4226	Comstock Scientific	1/2	12
439	439	427	1/2	4280	4246	Comstock Scientific	1/2	12
440	440	428	1/2	4300	4266	Comstock Scientific	1/2	12
441	441	429	1/2	4320	4286	Comstock Scientific	1/2	12
442	442	430	1/2	4340	4306	Comstock Scientific	1/2	12
443	443	431	1/2	4360	4326	Comstock Scientific	1/2	12
444	444	432	1/2	4380	4346	Comstock Scientific	1/2	12
445	445	433	1/2	4400	4366	Comstock Scientific	1/2	12
446	446	434	1/2	4420	4386	Comstock Scientific	1/2	12
447	447	435	1/2	4440	4406	Comstock Scientific	1/2	12
448	448	436	1/2	4460	4426	Comstock Scientific	1/2	12
449	449	437	1/2	4480	4446	Comstock Scientific	1/2	12
450	450	438	1/2	4500	4466	Comstock Scientific	1/2	12
451	451	439	1/2	4520	4486	Comstock Scientific	1/2	12
452	452	440	1/2	4540	4506	Comstock Scientific	1/2	12
453	453	441	1/2	4560	4526	Comstock Scientific	1/2	12
454	454	442	1/2	4580	4546	Comstock Scientific	1/2	12
455	455	443	1/2	4600	4566	Comstock Scientific	1/2	12
456	456	444	1/2	4620	4586	Comstock Scientific	1/2	12
457	457	445	1/2	4640	4606	Comstock Scientific	1/2	12
458	458	446	1/2	4660	4626	Comstock Scientific	1/2	12
459	459	447	1/2	4680	4646	Comstock Scientific	1/2	12
460	460	448	1/2	4700	4666	Comstock Scientific	1/2	12
461	461	449	1/2	4720	4686	Comstock Scientific	1/2	12
462	462	450	1/2	4740	4706	Comstock Scientific	1/2	12
463	463	451	1/2	4760	4726	Comstock Scientific	1/2	12
464	464	452	1/2	4780	4746	Comstock Scientific	1/2	12
465	465	453	1/2	4800	4766	Comstock Scientific	1/2	12
466	466	454	1/2	4820	4786	Comstock Scientific	1/2	12
467	467	455	1/2	4840	4806	Comstock Scientific	1/2	12
468	468	456	1/2	4860	4826	Comstock Scientific	1/2	12
469	469	457	1/2	4880	4846	Comstock Scientific	1/2	12
470	470	458	1/2	4900	4866	Comstock Scientific	1/2	12
471	471	459	1/2	4920	4886	Comstock Scientific	1/2	12
472	472	460	1/2	4940	4906	Comstock Scientific	1/2	12
473	473	461	1/2	4960	4926	Comstock Scientific	1/2	12
474	474	462	1/2	4980	4946	Comstock Scientific	1/2	12
475	475	463	1/2	5000	4966	Comstock Scientific	1/2	12
476	476	464	1/2	5020	4986	Comstock Scientific	1/2	12
477	477	465	1/2	5040	5006	Comstock Scientific	1/2	12
478	478	466	1/2	5060	5026	Comstock Scientific	1/2	12
479	479	467	1/2	5080	5046	Comstock Scientific	1/2	12
480	480	468	1/2	5100	5066	Comstock Scientific	1/2	12
481	481	469	1/2	5120	5086	Comstock Scientific	1/2	12
482	482	470	1/2	5140	5106	Comstock Scientific	1/2	12
483	483	471	1/2	5160	5126	Comstock Scientific	1/2	12
484	484	472	1/2	5180	5146	Comstock Scientific	1/2	12</

'98% of our trainees placed in jobs'

THE article on Page Six on April 3, describing Kalamazoo's attempts to solve the computer staff shortage problem, has resulted in several letters from training bodies which disagreed strongly with the assertion that "people presently being trained are not really suited to the needs of industry."

The managing director of Computecentre, D. F. Bollen, writes: "98% of people trained in our London centre last year were placed in jobs and of this a high proportion were repeat placements, in some cases with firms which have previously taken our trainees."

We would be interested to hear from firms which sometimes take on trainees and which feel that today's training methods adequately meet their needs.

Irish industry's growth results in higher salaries

WE don't hear much about the DP industry in Ireland, and when it comes to changing jobs it isn't the place many people seem to go. So it was interesting to receive a report and salary survey of the Irish computer business.

A Dublin-based consultancy, Computer Staff Recruitment, published the survey, which provides some enlightening information about business and pay in Ireland. For example, Irish people seem to be better rewarded than their English counterparts in computing.

An Irish junior programmer is, according to the report, a good 29.6% ahead of an English junior programmer, in terms of salary. This figure is reduced when one takes into account the currency conversion factor, but the difference is still substantial.

An interesting trend revealed by the CSR survey is that smaller companies in Ireland seem to pay much higher wages than the larger ones. For example, a figure of £3,750 is quoted for a junior programmer in a company turning over less than £2 million annually, which is surpassed only by the £4,224 salary earned by someone in a similar position working for a company of the other end of the scale which turns over £50 million plus.

If this is true in Ireland, however, it casts an interesting light on the industry there and job prospects. The cost of living in Ireland is slightly higher than in the UK, but people working in the computer industry in Ireland seem to benefit more from such things as company cars, fringe benefits and loans than do their counterparts in other industries.

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SOFTWARE FILE

Inflation accounting boosts RTZ, Safe

THE two biggest contenders for the large market in fixed asset accounting packages are expanding their horizons, following the upsurge of interest in accounting software prompted by the newly adopted inflation accounting standard, SSAP18.

Both RTZ Computer Services and Safe Computing, whose packages Fascia and Sofa share the greater part of this particular software market, consider that the adoption of inflation accounting in the UK will pave the way for the rest of the English-speaking world.

The sales of RTZ's Fascia (CW, April 3) have encouraged the company to explore the Australian market through an independent agent, Adapts Software, with an eye to further markets including Singapore, Indonesia and Hong Kong, where there are existing customers.

RTZ Director Paul Methven cited Australia as a good place to start in building up an international market place on which to capitalise in the future, since the country shares our inflation problems as well as being English-speaking.

He said that at the moment there were not many UK home-grown products sold there to compete with Fascia, and added:

"RTZ may soon be appointing agents in less established countries."

Safe Computing is also looking to the English-speaking market and has negotiated a marketing agreement with ICL to cover international rights to the package on ICL hardware all over the world, except for places such as the UK, Canada, and parts of Europe where Safe has its own offices.

Using its parent company, Chubb, Safe is also looking to non-UK sites in such countries as Australia to launch Safes, and is hoping to address the same markets as RTZ.

In the UK Fascia and Safe are not the only packages to get a slice of the action precipitated by the new standard. Marketers of PCL's Ace, Allegro's Spiral, Bureau's Facet (for Digital Equipment PDP-11s) and the fixed asset suite from Lowndes Ajax all report a flood of inquiries.

The prevailing opinion is that the real boom for packages will be in three or four months, although that would leave little time for the lengthy process of taking on data in order to meet the deadline of January 1981.

The statement of Standard Accounting Practice No. 18 aims to implement current cost accounting so that yearly accounts reflect the effect of inflation, particularly by assessing the value of assets according to replacement prices rather than original costs.

After much discussion the standard was implemented at the end of March, and must be applied to annual financial statements for periods beginning on or after January 1980.

It affects nationalised industries and listed companies, with specific exceptions such as insurers and property investment, and any large company with a turnover of £5 million.

When the EEC fourth directive comes into effect, the term "large" will also embrace any company employing over 250 people or with fixed assets of over £2.5 million, which satisfies any two of the three criteria.

Aid to measuring MVS performance

IBM users looking for real time information on the performance of MVS could be interested in a software tool being developed by performance management specialist Tesdata.

Among other features, it should be able to assess the effectiveness of systems resource management parameters and suggest how they could be changed.

From Tesdata's point of view, the software is intended to boost sales of its MS performance management systems and it will only be able to run on MS kit.

Tesdata stresses that it is not moving into the software products marketing business.

The video terminal on an MS system running the software will provide real time access to MVS performance information and will also cover TP response times and the performance of VIO and VTAM.

Tesdata's existing MVS monitor, S-Pac, can only record batches of sampled performance data on tape for transferring later to an MS system. S-Pac also confines itself to mapping out which programs are using the MVS paging facilities.

According to Tesdata, IBM's own monitor, Resource Management Facility, only provides the user with figures, while Tesdata's software will be able to make use of the graphics hardware on the MS kit.

According to Tesdata the Systems Resource Management facility in MVS can assign priority jobs badly and cause a loss of machine time if the parameters are set up badly by the IBM systems engineer.

Tesdata is developing the software on a big IBM 303X miniframe at a large unnamed computer services company in the UK and it will be available to customers all over the world. Tesdata says that it should be ready by the end of the year.

Which people make the best recruits?

WE have written extensively about graduates, their opportunities, their training and their suitability for a job in computing. We have also made — and been criticised for — comments on graduates in arts subjects who are now finding themselves with few job openings, bar the ever-expanding computer business.

We have so far ignored, however, those graduates who have followed computer science courses at university and whose education has followed a distinct bias towards a career with computers.

How qualified are they? It is an accepted fact that academic qualifications obtained through universities bear little or no resemblance to their subjects as they are applied in the real world. An economics degree does not make an economist, an accountancy degree does not make an accountant, and a computer science degree does not make a systems analyst any more than a French degree makes you French.

Universities will no doubt argue that the courses they offer are not designed to provide a student with an automatic passport to a specific career, but to educate and train the mind, and are consequently not tailored to the requirements of industry.

Unfortunately, computer science graduates themselves will argue that as they know a great deal more about computers than graduates in other subjects, they should be offered positions in the industry.

Ronald Bain, marketing chief of Unilever Computer Services, was quoted in the Observer recently as advocating the recruitment of people with business experience, and abandoning altogether the policy of recruiting raw graduates into computing.

He suggests that more employers should take advantage of refresher courses in computing for intelligent and enthusiastic people from other industries.

F. Perkins, the managing director of I.P. Sharp, on the other hand, while he admits that students on sandwich courses can be useful, says that on the whole the quality of the graduate coming into industry is rapidly declining. Is this a fault of the universities and polytechnics, or does the blame lie even further down the line with the schools?

Or is industry at fault, for expecting educational institutions to churn out year by year exactly the right sort of person to fill the gaps in industry and solve the computer staff shortage problem?

Godasyl compatible database for micros

A CODASYL compatible database management system for microcomputers is being distributed by US company Microsoft. The product, named Micro-seed, runs under CP/M with Microsoft's Fortran 80 as the host language.

It is a compatible subset of the Seed DBMS, which originated with International Database Management Systems, and the company claims that it is the first of its kind, being able to cope with microcomputer applications where the database is too large for conventional file handling.

Micro-seed is written primarily in Fortran, and is said to be transportable to various 8080/8088 hardware configurations. A 64K microcomputer is required to support the DBMS.

The data manipulation routines can be called from application programs, in Fortran or other host languages such as Cobol-80, Pascal-M and Basic, which will be available in future releases. Other future plans include a report generator, Harvest, and an interactive utility program, DBLOOK.

The system in its present form is available from the Belgian branch, Vector Microsoft, for about £500.

THE job accounting report system, Jars, marketed by Johnson Systems UK has been enhanced for DOS/VSE. In Release 4.0 of the product, Jars is a performance measurement and billing system for long-term and day-to-day use, and is available for all releases of OS and DOS with options including CICS/VSE, TSO, VM/CMS, and most recently added, IMS/VSE (Software File, February 14).

A FORTRAN 77 compiler implemented in 1978 and standardised within the Pascal language developed by Advanced Computer Techniques of New York. The product was first developed for Honeywell Level 6 and can be customised to run on a variety of machines.

THE systems and programming group at Sherwood Computer Systems has established a new service, Sherwood Computer Systems, to provide a specialist in the UK market and development team in the UK.

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OP SPOT

How the typical trainee operator should spend his time

THE typical trainee operator spends far too much of his time cleaning peripherals and too little adding to and sharpening his skills.

Rather than studying the installation's applications, operating system and fault diagnosis procedures he is more likely to be found cleaning the printers, punch units, card readers or tape drives.

It is of course, important to keep the devices clean. But only insofar that dirt and dust can have an adverse effect on their functioning.

Tape decks for instance, should be thoroughly cleaned at least twice per shift. This prevents read/write errors which

are particularly annoying when they spoil the operators' chance of finishing the night shift early. The printers should be thoroughly vacuumed at the end of the night shift. Print trains should be wiped with a piece of cloth, and this is particularly important when the printer is used for pre-printed stationery or forms which will later be read by an OCR device.

Punch card units should also be vacuum cleaned and their bins emptied. But please remember that chud — the tiny rubbing pieces of card that accumulate in the bins — can be a health hazard (Hint of the week, On Spot, January 18, 1979) and should be handled with care.

So keeping the peripherals clean is important. At some installations, however, the trainees are expected to perform duties which should be carried out by a site engineer or a cleaner.

Site engineer? At one installation I know, the trainees are expected to remove the print train before wiping it clean. They also have to open and vacuum clean the back of the printer.

A cleaner? At another installation trainees have to clean all work surfaces, video screens

and, if the site manager is in a particularly keen or bad mood, even vacuum clean the printer room floor.

Anyway, when the trainee isn't cleaning the peripherals, or mounting tapes or discs or loading the printers, he should try to learn more about the technical aspects of his work.

How? Well, the trainee must take the trouble to watch his senior colleagues in action and ask as many questions as possible.

The hard copy log is a valuable

source of information. Use it during spare moments to learn about system messages and see how commands are used.

To learn about job control language run some small jobs. The evening and night shifts are best for this. If they go wrong, so what? You will learn a lot by sorting out your errors.

Also look at the listing of users' jobs which have gone down with errors. But please don't try to put them right; you will only fall out with your operations manager.

Incentives to change jobs

THE chance of a move into programming, a single shift system and a salary in excess of £5,000 per annum — these are the incentives to make an operator give up his job and move to another installation, according to a salaries report from Modern Computer Services.

By the term "operator", the report means someone with one to two years' computer room experience. In London and the Home Counties such a person gets a salary in the region of £4,000 to £4,500 a year.

The report goes on to point out that an operator with good JCL and utilities experience is more likely to be attracted by a more senior and better paid position.

The average senior operator — that is, someone with two to five years' experience, including shift leaders — earns between £5,000 and £5,500 a year. A salary of over £7,500 is needed to tempt him into a move.

It points out that job advertisements for the position of operations or shift manager usually get a good response, with many from shift leaders who have too little experience or just aren't equipped for the job.

* This figure refers to London and the Home Counties.

Bonnie goes Dutch....

BONNIE O'SHEA, the contract operator featured in Op Spot (CW, March 18) is currently on a six-month assignment in Utrecht, Holland. She is working at Volharding, a dairy product company.

"I got the contract while on a week's holiday in Amsterdam — and it's just what I wanted. There are three of us operating a Philips mini. We work overlapping shifts — seven in the morning till three in the afternoon, and 11 in the morning till seven in the evening."



Communication vital to development

THE operations department is all too often on the receiving end of poorly-documented systems which have been written with the scantiest of attention to scheduling requirements.

Once accepted, such applications cause operations and users all sorts of problems, particularly when things go wrong and restarts and reruns are necessary. They disrupt the running of operations and the site as a whole.

It would be unfair to put all the blame on systems and programming. Quite often they just don't get enough help and suggestions from operations and the user.

The data centre impact statement — a series of documents, including checklists and project checklists — is one way of keeping operations, users and upper management in touch with systems being developed, according to a portfolio from Auerbach.

Entitled the Data Centre Impact Statement — General Procedures, the portfolio stresses that communication between different sections of the installation is vital to project development.

"When the Impact Statement is used, each data centre section supervisor is responsible for monitoring the appropriateness of the part of the project that will affect his particular area. Thus, sections within the data centre have valid reasons to require specific information about the project, and can use the impact statement to communicate their appraisal of the project to management."

"In order to maintain consistency, all new or changed systems must be controlled through the impact statement. Assuming the department uses a project management system (and if not, such a system should be introduced) all projects placed under that system, regardless of their size, must also be monitored with the impact statement."

"The impact statement is

each of his team is working according to the proper time-scale and standards.

"Misunderstandings about input documents, control cards, operations, scheduling, system run times, and so on can be more easily resolved to the mutual satisfaction of the project leader, the users, and the data centre prior to implementation, because the detailed checklists in the impact statement will reveal those items in the project that have not yet been completed."

Members of upper management find the impact statement useful for two main reasons: it keeps them up to date about project development and provides different views on how it will fit in with and affect the organisation.

The first step in the procedure is to assign someone to gathering information and generally co-ordinating the statement. According to the report, the job should be given to the hardware specialist, provided the site employs such a person.

He should then meet with the project leader and get information on the nature of the project, its scope and length, the team members, and the user areas affected by the project.

The impact statement provides for review at three stages of the project: general design, detail design and system testing.

"If the general design is well

done, it should provide sufficient detail to complete all sections of the impact statement. While this information will often change as the project moves towards completion, these estimates will at least provide a general picture of the project."

All items on the statement should be completed during the second, or detail design phase. "As a part of the detail design review, the project leader should provide as close an estimate as possible of the anticipated run-time for the entire system."

"Estimates of total run times given at the end of the detail

design phase will often change by implementation time, but the project team should be able to produce firm, dependable run-time estimates at this point."

Using the final report and the impact statement, the data centre manager can determine whether the project is complete and satisfactory from all viewpoints — the project team's, operations, and the user's.

* Data Centre Operations Management, £120 including bi-monthly updates (of which the above is one). Distributed in the UK by Computer Aid for Management, 155 Great Portland Street, London W1. Tel 01-637 9098.

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Cincom Systems



High price, high quality rating on 5520 word processor

HIGH price and very high quality is the rating given IBM's 5520 shared logic word processing system from the company's General Systems Division.

It is based on the processor technology of the System 34 workstation-based business system, and comes in four models, 20 to 50 (CW, November 15, 1979). The 20 comes with six workstations and three printers, and the 50 can have a maximum of 18 workstations and 12 printers, which can be ink-jet or daisywheel.

Although looking like the standard display terminals offered with other GSD products such as System 38 and the 5280 remote terminal system, the 5520 single and 5254 dual workstation terminals are specific to the 5520, and feature special typewriter like keyboards. The only internal intelligence is applied to things like character fonts, while the word processing software all resides in the central station.

Japanese language WP from Fujitsu

HOTTEST property from Fujitsu on the company's home market in Japan is a new Japanese language stand-alone word processor, the NTW-100.

It comes with a new keyboard specifically arranged to take account of the frequency of usage of each character.

The Japanese language is primarily written in two forms, Kana and Kanji. Kana is a syllabary where each character represents a phonetic sound and it has a manageable number of common characters. Kanji is a set of ideograms based on the original Chinese characters, and is virtually unlimited in the number of different ideograms which may be required, but it is generally agreed that in most applications 6,000 to 8,000 will be enough.

Although Kana is much more

manageable than Kanji, Japanese prefer to read Kanji; newspapers and books are printed in Kanji with unfamiliar words expressed in Kana. Despite the enormous number of Kanji ideograms which may be needed, people generally leave school in Japan knowing only about 2,000 basic ones.

The new NTW-100 word processor, which comes with screen, 16-dot matrix printer and two floppy disc units, and costs £2.7 million; a little over £5,000, has a Kana keyboard, but the machine translates Kana syllables into Kanji ideograms, and these appear on the screen.

Although of interest in other Asian countries such as Hong Kong, Korea and China, the NTW-100 has no direct relevance in countries which use the Roman alphabet.



Nashua 4420 (CPC 5448 cmd - phoenix compatible) 16 megabyte cartridge. Please send me full information. Name: Address: NASHUA QUALITY. Nashua Computer Products, 10000 Highway 100, Nashua, NH 03046 USA.



Colour graphics on HP desk-top series

COLOUR graphics display, with complex graphics computation, is offered by the HP Series 9800 system 45C introduced by Hewlett-Packard. The desk top 45C provides the user with a graphics language consisting of 70 statements that relieve the user of programming jobs like generating geometric figures. The standard 45C system with 187K bytes of memory costs about £23,150.

The colour commandr in the graphics language allow alphanumeric and vectors to be displayed in any of eight colours. Different levels of intensity provide a choice of up to 4,913 shades according to Hewlett-Packard. Each of the three electron guns — red, green and blue — is program controlled. The 580 x 448 dot display is said to be the first raster screen with a tracking cross. A light pen is supplied as standard.

Hard copy is generated by an 80-column thermal printer. Other 45C features include a ROM based operating system and H-P's enhanced Basic language.

IBM announces field upgrade from 4341

THE long-awaited 4300 model to slot between the 4331 and 4341 has been announced by IBM as the 4331 Model Group 2. First forecast for launch last summer is, as predicted, a field upgrade from the basic 4331 (CW, May 24, 1979).

Maximum main memory is quadrupled to four megabytes,

the same as offered on the 4341, and an 8K-byte cache is added; only the 4341 previously had a cache.

In addition to the cache there is 128K-bytes of relocatable control storage, and as well as the byte and block multiplex channels from the 4331/1, there is a high speed block multiplexer

channel from the 4341 which supports the 3830 and the new 3880 disc controllers. A second optional adapter for attaching 3310, 3340 and 3370 disc drives is offered.

Field upgrades, which will be available in the first quarter of next year, will take two shifts, and involve laying on additional

power, swapping some processor boards, adding a second processor input-output bus, an additional microprocessor and more channel adapter hardware.

First shipments of 4331/2s are set for last quarter 1980, and a minimum configuration costs £90,000 with 1 megabyte of memory and no options.

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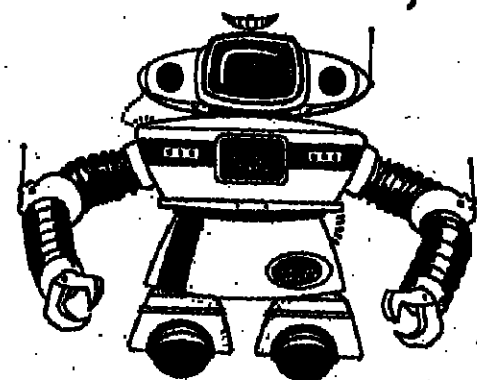
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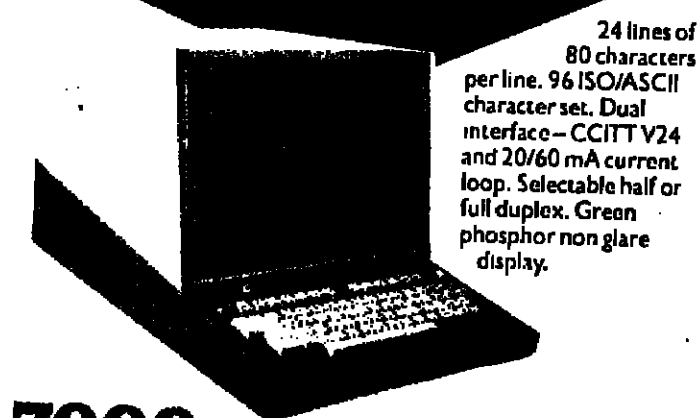
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CHALLENGE TO THE 4300

Nixdorf challenges IBM with own operating system

NIXDORF plans to enter the lower end of the IBM compatible processor market with its new line of 4300 machines, to offer a complete system with an IBM-compatible system than an IBM operating system.

Siemens' 4300 operating system is Fujitsu's OSIV-F4 which is a fully compatible

version of IBM's MVS. Nixdorf has acquired the Computer Software Company of Richmond, Virginia which has developed compatible but much enhanced versions of IBM's DOS and DOS/V.

Nixdorf has still not announced a processor, but US industry sources say the company plans to build Two Pits V32

processor under license in West Germany. This would be consistent with Nixdorf's existing manufacturing activity since the company builds a number of standard processor modules using the AMD 2900 family of bit-slice microprocessors and particularly those to applications such as the 8870 business computer and 8864 banking terminal processor by use of microcode.

The Computer Software Company has 100 employees and 750 customers for its EDOS and EDOS/V operating systems. Turnover last year was about \$5 million, and a total investment of \$11.5 million in the company by Nixdorf includes the purchase price.

EDOS/V is claimed to have all the features of DOS/VSE, the enhanced version announced by IBM with the 4300 line, and also to have some features from OS/VSE.

IBM DOS/VSE programs in Basic, Cobol, RPG, Fortran and PL/I are claimed to run unchanged under the EDOS operating systems.

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Elbit ready with CPU for the European market

EUROPEAN involvement in the IBM plug-compatible processor market is growing rapidly with several unnamed companies preparing to announce products based on a new processor, the ANAT from Elbit of Israel, and Olivetti of Italy taking a stage of up to 40% in specialist manufacturer IPL Systems of Bedford, Massachusetts.

Elbit, 37% owned by Control Data and hitherto best known for its Pact business and key-to-disc systems, has developed a low-end 370-compatible processor available in three models, the ANAT I, III and V, covering the power range of System 370 from the 125 to the 148. Maximum main memory is 4 megabytes.

Nixdorf has had detailed discussions on the ANAT (CW, February 7), but it is uncertain whether the West German small systems manufacturer will adopt the ANAT or the rival V32

processor. An input-output processor of five megabytes per second emulates the IBM bit and byte channels. A total of six channels, up to five byte multiplexers and up to three block multiplexers, are offered, with a minimum one of each. Minicomputer peripherals as well as low-end IBM 370 peripherals are supported, and Elbit is offering an IBM 3330-type disc drive. Up to eight drives, each with 100 or 200 megabytes of storage can be supported. Operating systems

supported are DOS/VSE OS/VS1 and VM/370. Control Data is considering marketing the ANAT in the US. Although the largest CDC Omega which comes from IPL Systems, the ANAT addresses a different market and would generally be sold in small expandable configurations.

First shipments of the smaller two models are set for the latter half of 1980, with the ANAT V following in the first half of 1981. Elbit has an extremely ambitious programme with a target of 500 machines in the second year of manufacture.

Marketing is likely to be mainly by OEMs, but the UK subsidiary also plans to sell the ANAT to end users, both in association with software houses and as an upgrade, with some conversion, for its existing PACT users.

Nanodata eyes other current mainframes for emulation

KEY feature of the new IBM plug-compatible processor offering from Nanodata Corp is a microcode overlay for the DOS/VSE, VM/370 and MVS operating systems which, the company says, enables the operating systems to manage an indefinite number of CPUs. Having produced its IBM-compatible machines, Nanodata is eyeing other current mainframes for emulation, but is not saying at this stage which manufacturers are its target.

Three models of its 6300 series have been announced. The initial model is the middle one, the 6336. Available immediately and coming with one to four megabytes of main memory, the 6336 is claimed to be 3.5 times as powerful as IBM's 4331 Group 1 model. The 6333 model, claimed to offer 1.7 times the power of a 4331 Group 1 set for delivery next January and will have 512K to 2 megabytes of main memory. The 6343, the first dual processor model, will follow later in 1981 and again will have one to four megabytes of main memory. Each model will be field-upgradable to the next in the line.

Nanodata says that the key to its design is complete physical and logical separation of input-output and memory.

All mapping is done by memory itself, and the service processor only handles system start-up and local or remote diagnostics via a diagnostic bus," a spokesman told Computer Weekly. The technology is TTL with some embedded ECL. According to Nanodata, a significant advantage the machines offer is the possibility of unattended remote operation, not possible with IBM's 4300s. Unlike Amdahl, which has just announced its intention to sell its software to IBM users without Amdahl machines, Nanodata has no plans to market its software except to its own customers. "It's all in microcode, so it would be difficult to apply to an IBM machine."

As well as doing emulations of other machines, which will definitely be "living" machines rather than ones like the Xerox Sigma which is emulating, Nanodata plans to add more processors to its central complex, and to get closer to true "non-stop" operation.

Eight mips machine

NATIONAL Advanced Systems is likely to announce an IBM compatible machine with a power of eight million instructions per second by the end of the summer. Built in Japan by Hitachi, the machine will probably be the same or similar to the model introduced last year by Intel as the AS/8-7034 (CW, July 19, 1979).

Following the collapse of Intel's computer business, National renegotiated the agreement with Hitachi covering the machines sold by Intel as the AS/8-7034 and AS/7-7033 which now form the National AS/7000 family. An agreement between National and Hitachi on the AS/8 machine probably would have been announced by now, but for the delay in the introduction by IBM of the H-series. It appears that National is now looking for a partner for the H-series.

Meanwhile, the boss of National Advanced Systems, Floyd Kvamme, has confirmed that the development of the large scale IBM compatible mainframe codenamed "Lightning" is National's development centre at San Diego has been scrapped. Kvamme told Computer Weekly that National was carrying on with one surviving processor development programme. He would give no details of the machine, but industry sources indicate that it will be a medium scale machine somewhat larger than the biggest processor currently built by National, the AS/6000, which matches the IBM 3036. The new machine is codenamed Shark.

Nearly last year National axed the low-cost IBM compatible System 360 processor aimed at the OEM market and Kvamme told Computer Weekly that National was no longer interested in moving back into the OEM side of the business.



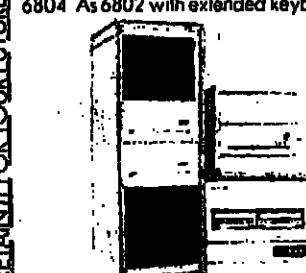
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IBM 4300 series terminal

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TELETYPE

THE NCC AT ANAHEIM.....

Software industry 'monster' by 1990

The software industry will be a monster by 1990 — and you'd better believe it.

That was the message from John Imley, chief executive of Management Science America, which, with 700 people, 4,000 customers and \$45 million turnover last year is targeting \$40 million in 1990.

In whirlwind lunchtime session he gave his view of the decade ahead, in which 10% of company chief executives will be coming up through the computing ranks and in which software companies will become the DEC's and the Data Generals of 1980.

"How a country handles its data will become more important in the 1980s than how it handles its energy resources," he suggested. "Japan is already outstripping the productivity of their programmers is four to five

times that of ours. Imley's talk was laced with biting humour. He announced, "At noon today, a merger was declared between Honeywell and Fairchild. The new company is to be called Fairwell Honeychild."

"Today the schoolyard hero is not the champion at pitch and toss; he's the kid who can crash the college computer and get at the database. Our children should be playing with personal computers at the age of 10."

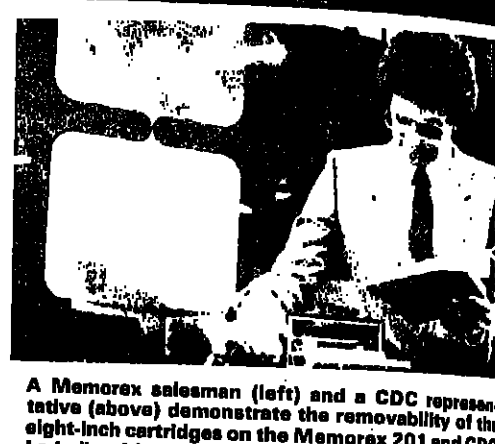
Underlining the transformations taking place in the industry, he noted that Radio Shack was selling payroll packages for \$18.95 where traditionally such things cost anything from \$20,000 to \$100,000 — and that Sears Roebuck and Company have teamed up to develop a 9in satellite dish antenna for \$350.

That compares with satellite earth stations which cost \$2 million in 1975.

"There is more enthusiasm about the Apple III personal computer than about IBM's H-series," he declared.

He quoted a forecast that in 1990 IBM would consist of five divisions. DP Division would be twice the size of the whole of IBM today, and getting 50% of its revenues from software. GSD and Office Products would be combined and serving the "office of the future" market.

Recognising the high value of peripherals, a separate peripherals division would be marketing to all comers. IBM would be back in the services business, offering access to huge databases. And the fifth division would in effect be a bank, reflecting the enormous leasing revenues.



A Memorex salesman (left) and a CDC representative (above) demonstrate the removability of the eight-inch cartridges on the Memorex 201 and CDC Lark disc drives.

Launch of 8in cartridge drives

MEMOREX and Control Data both introduced eight-inch Winchester type disc drives with removable cartridges at NCC. The big advantage offered by these units over existing eight-inch Winchester drives with all fixed platters is that no back-up is required in the form of a floppy disc or magnetic cartridge tape unit.

The Memorex 201 provides 125 megabytes of storage on a fixed platter and another 12.5

megabytes on the cartridge while the CDC Lark, offers eight megabytes of fixed and eight of removable storage. The CDC unit, which has been expected for some time, is available for evaluation now and volume shipments should start in the third quarter of 1980 according to CDC. The Memorex 201 will not be available in volume until the first quarter of 1981.

Both drives cost about \$3,000 in single units but the OEM discounts do not look as dramatic as those available on units with all fixed media.

Surprisingly, four other prominent firms in the eight-inch Winchester business — Shugart, BASF, Pertec and Kennedy — all

expressed a distinct lack of concern about the CDC and Memorex announcements. A BASF spokesman said his firm had no plans to develop an eight-inch cartridge unit and commented that the removability of the media defeated the reliability purpose of Winchester drives. A Shugart spokesman pointed out that the cartridges on the Lark and 201 were non-standard and as a back-up medium were far more expensive than either diskettes or tape cartridges. Pertec said that it was not developing an eight inch cartridge unit while Kennedy remarked that it was looking at the market and might go ahead with developing a cartridge drive.



JUST in case visitors to the NCC did not realise they were from the UK the true blue Brits on the stand of Leicester-based software houses Tube down the point home by adorning everything, including themselves, with Union Jacks. And if that was not enough they even tried to recreate the atmosphere of an English pub by equipping the stand with a dart board and old fashioned beer pumps.

The serious intent of the Tube exhibit was to promote the company's powerful systems development aid, Cupid, which is spearheading what the firm described as a "major assault" on the US market. Tube was armed with facts like the selection of Cupid by Digital Equipment for use on its own in-house accounting systems in Europe.

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MICRO NEWS

Maintenance for Pets and Apples

A SUBSIDIARY company called Terminal System Services has been set up by Mideltron, the Derbyshire-based terminal and DEC-based microsystem supplier, to provide a maintenance service for its range of products. TSS is also undertaking service work on personal computers such as Pet, Apple and Superbrain.

The company provides two forms of service to its customer. For the one-off repair job, it offers a "bring and we'll mend" type of contract for a fixed labour cost of £25 per unit plus the cost of parts.

The operation is controlled by the base workshop manager, John Rees, who carried out a similar type of repair service at Luton-based Pet distributor, Isher-Woods. Facilities at the Helder workshop include

computer-controlled board testers which can cope with high volumes of boards.

TSS also runs an on-site maintenance service from a string of centres in Glasgow, Manchester, London, Portsmouth, Bristol and the Belper headquarters. As the workload increases, the company plans to set up more service centres. For a related support cost of about 16% of the hardware value, TSS will maintain a customer's system under a comprehensive cover.

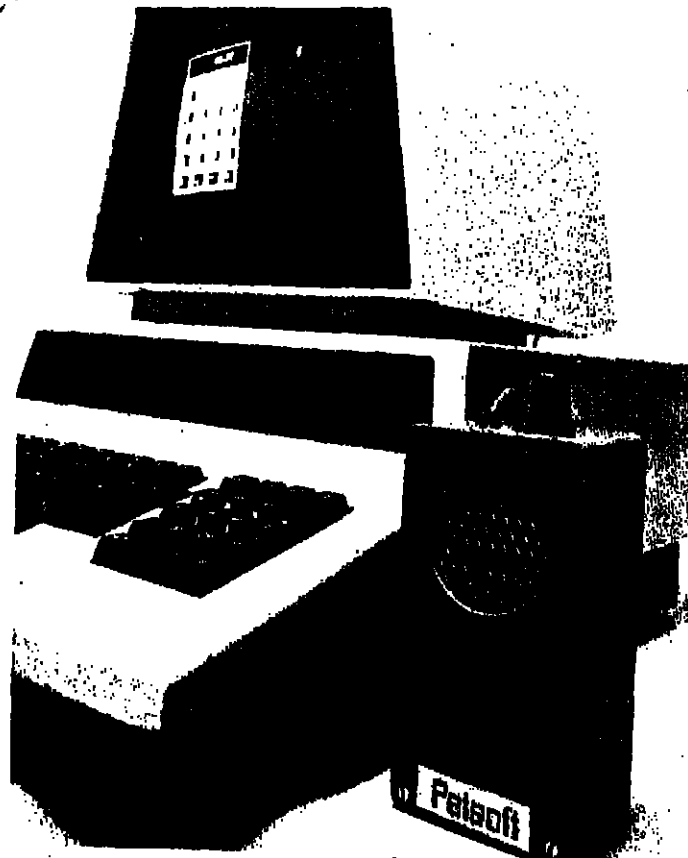
Modules are exchanged where possible and functional spare assemblies are located in most service centres to support the field commitment. With products like the Superbrain complete units can be exchanged and returned for depot repairs. The managing director of,

TSS, Jim Myson, who previously worked for Digital Equipment's field service marketing department, has already taken on several customers. He sees the market, which up to now has been grossly underserved, as capital intensive and an area of dramatic potential growth.

Myson's service is geared to meet the correct customer expectations. Immediate attention is given to emergencies, when a customer cannot wait long for an engineer.

Alpha dealers

EIGHT more software and systems dealers have been appointed by Alpha Microsystems, bringing its UK network up to 18. The company claims that it has now reached half of what it believes to be an optimum size for a dealer network.



by Eileen Stalner

Competitor for Texas' talker

A "TALKING Calculator" program (available from all Pet dealers, and by mail order from ACT Petsoft for £10 plus VAT) is the first move in a speech synthesis strategy which could provide Texas Instruments with future competition to its TI 99/4 talking home computer (CW, April 17).

On insertion of the Talking Calculator cassette, a picture of a calculator appears on the Pet screen to provide a visual representation of each calculation. As each key on the numeric keypad is depressed the Pet system speaks the name of the key. The end result is the Pet talking through a calculation as the user works through it.

An external piece of hardware known as a User Port Speech and Music Generator, with volume control and connectors, is required with the process. This consists of a loudspeaker to produce each sound and is available for £27 plus VAT.

By using the speech option it is easy for the user to detect errors as they are made. The presence of sound also enables blind people to use the Pet, and Petsoft has already received enquiries from the Royal National Institute for the Blind.

Compared with TI's talking 99/4, which is aimed directly at the consumer market, the Pet talking computer is meant for more serious use and can be implemented at a much reduced cost. Although the Pet speech system does not have so much to offer yet, the cost of hardware plus a speech synthesis program totals £37 plus VAT twice.

ACT Petsoft's talking calculator program can be followed through on the screen of the Pet. See story, column 8.

Intel profits well ahead

First quarter net profits have been reported by Intel to be \$24 million on a turnover of \$205.2 million. Previous year's results showed a net profit of \$15.3 million on a turnover of \$135.3 million. The company expects to spend \$180 million this year on new equipment and facilities.

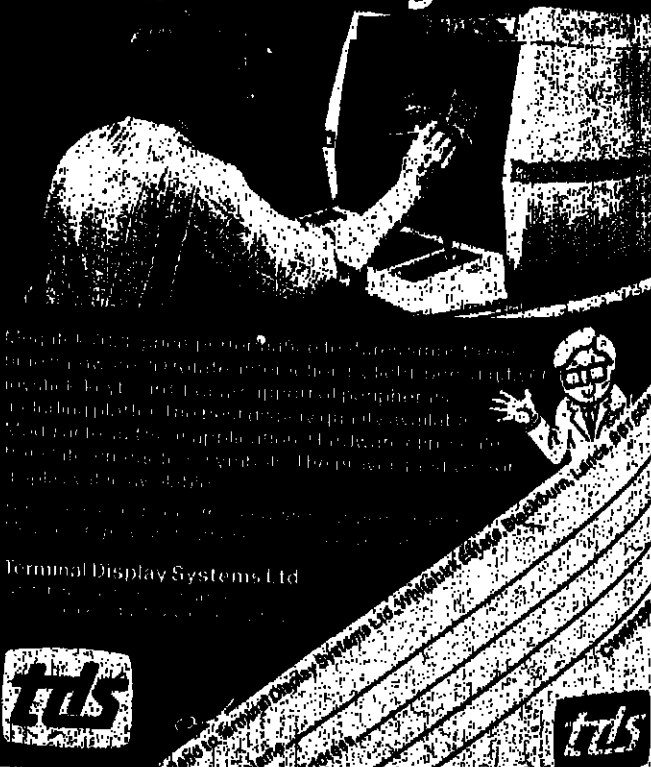
Horizon hard disc from North Star

WINCHESTER back-up is available for Horizon systems with the introduction of an 18-megabyte hard disc enhancement from North Star Computers. The cost of a Horizon and the disc system, which includes 84K RAM, two quad-capacity minifloppy disc drives and one hard disc, is \$9,329. Up to three additional hard discs can be added to the same system at a cost of \$4,889 each.

Floppy for AIM

THE first floppy disc system for use with Rockwell's AIM 85 system, called DAIM, is available to users and dealers from Portable Microsystems of Brackley, Northants. Costing £895 plus VAT for a single drive, a controller and a power supply unit, the system is compatible with, and complements, the AIMEM 32K-byte add-on memory system.

The Total Refresh Graphics System



Terminal Display Systems Ltd

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A growing monster that is devouring its dealer

DESPITE the fact that technology is wonderful, and microelectronics and the microprocessor have all but reached the level of deity, something is rotten in the state of micro-computerland. The all-powerful, all-purpose microgod seems to have created a monster that is small, as yet, but growing by leaps and bounds and devouring much of what comes in its way.

The monster is not hard to see. The market potential of the Pets, Apples, TRS-80s, Cromemcos et al, even in the most obvious sector of small business systems, is little short of remarkable. It has the capability to grow like Topsy. But in growing, it is showing a marked tendency to devour those that helped bring it into the world in the first place — the microcomputer retailers and dealers.

Two well-known names have already succumbed since December, and even though both companies have been saved, there will almost certainly be more going under before the year is out. But something can be done to save them, something no doubt unpopular with the users, but probably essential for the long-term survival of the chain of supply and support.

That something is to start seriously considering pushing the prices of microcomputer systems UP, not down. It is time to start educating the potential customer to expect to pay much more for a system than the current crop of advertisements

might suggest.

Although it was widely believed, a year or two ago, that microelectronics would force down the price of computing power to the point where micro systems would be used by everybody, these bright visions have not come to pass. Nevertheless, microcomputer systems have been taken up enthusiastically by small businessmen and the professions, who have clearly seen the advantages that can be gained from using computers. The cost of the system was the only obstacle, and microelectronics has solved that.

But, in solving the cost problem, the microcomputer supply industry has taken things too far, and fallen foul of its own marketing gambits. The low cost of the systems being sold is now creating major problems for the supply industry, especially the companies that provide the front end of the marketing chain — the dealers.

One reason for this is that microcomputer systems, by their very nature, cannot be merchandised like washing machines or hi-fi equipment. Neither can they be sold purely on the low cost of the hardware. Yet this is what has been happening, and it is this that has prompted the current situation in which any number of dealers could go to the wall this year.

The popular marketing plat-

form that produces equipment adverts saying such things as "here is a box that can solve all your problems for under £500" does no-one any favours, least of all the dealers and users. The users especially, unless they actually understand computers, are more than liable to believe such an advert, rush out and buy a computer, sit it on a desk, key-in "GO" and wait for the miracle to happen.

When the inevitable happens, and the miracle doesn't, that user will be rushing back whence he bought the "box". He will say to the dealer "Make it solve my problem", and the dealer will reply "Certainly, sir, that will cost you another £3,000."

It is time to start educating the potential customer to expect to pay much more for a system than the current crop of advertisements might suggest.

This leads to two disillusioned groups of people. The customer is disillusioned because he has been "educated" in terms of a £500 outlay, and is now being told that the best part of £3,000 needs to be spent. The dealers are disillusioned because they are always put on the defensive by the marketing gambit. This can be doubly galling if they have tried to point out the customer's mistake before the sale.

So there is an urgent need for the marketing platform of microcomputer systems to be changed. The all-pervasive nature of their application, however, does mean that a merchandising style of marketing and sale is necessary. That style revolves around the use of distributors and dealers to present the manufacturer's wares to the market, and to support the users in making the best of them.

The distributors and dealers are necessary for the simple reason that no manufacturer would have the capability to support the needs of individual users by itself. It needs the distributors and dealers to share that load.

There is a strong argument for raising system prices to prevent more dealers being forced out of business during the rest of this year.

Given that the largest market sector for microcomputer systems at the moment is in the occupational areas of small business and the professions, there is also scope for the development of another part to this new marketing platform. It is a part aimed at helping potential users actually understand what they are becoming involved with, and might be termed pre-sales support.

What this would be aimed at is the vast majority of potential

by Martin Banks

When he left the post as Computer Weekly's Micro News editor, Martin Banks took a last look around the industry. Banks, who is now with the Mackintosh consultancy group, posed the question: Should the prices of micro systems be pushed up to ensure the survival of dealer networks?

£3,000 per system, yet that is the minimum level of support a customer should expect from a dealer. It is a service that should be followed by after-sales hardware and software support and advice, much of which is often given free, even if formal support contracts exist.

The other factor is the growth of the market itself. If at least half of the dealer's margin goes into financing the purchase of next month's growth, month in and month out, then the cost of customer support and handling has to be borne out of the remainder of the margin, along with all the other costs of running a business.

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What this would be aimed at is the vast majority of potential users who do not understand computers and as such do not want to. All they want is an operable solution to their particular problem. But it is usually the case that the people running a small business, though they know a great deal about the product or service that forms the basis of that business, know very little about the nitty-gritty of business administration where a microcomputer can be of most immediate benefit.

The answer may well be that they need some form of assistance, not only to help them define their problem, but also to do as much as possible to organise the administration of their company before a microcomputer is purchased.

If the end user prices of systems are pushed up, this will be the type of service that the dealers will be able to offer their customers. Such a move would enhance both the reputation and sales of dealers, with little harm done to the main suppliers and manufacturers.

By the same token, though the users might at first be a little upset at such a move, they would in the long run be much more certain of getting value for money when they paid up, rather than finding out afterwards that they hadn't got it.

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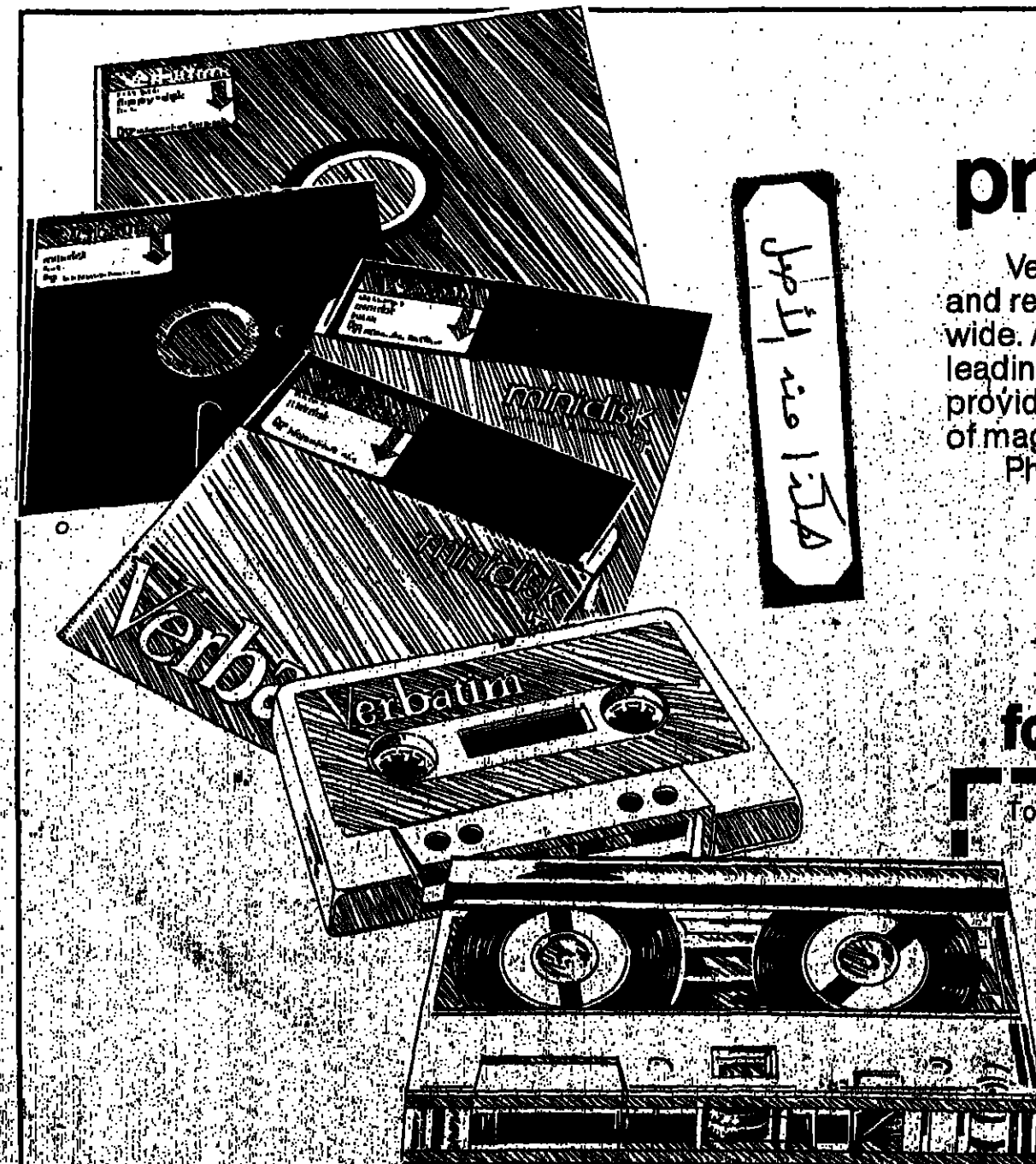
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COMMUNICATIONS 80

Report by Donald Kennett

First public airing in UK for System X network

THE Post Office's planned digital network System X, got its first UK public airing at Communications 80 in Birmingham and the voice guidance feature it uses to make sure subscribers understand the available facilities and use them accurately proved itself well suited to public demonstration as well.

Keying or dialling the code for the call diversion service elicits a response which prompts the user to enter the number to which calls are to be diverted, and completion of the process is confirmed by the message: "Calls are being diverted to 2314." Messages are assembled by the exchange from a vocabulary of 200 recorded words.

Call diversion and abbreviated dialling are the first services which will be offered from System X exchanges, starting with Woodbridge in Suffolk at the end of this year. The Post Office will shortly enter discussions with the Post Office Users' National Council and other interested parties on whether to offer customers the benefits of being attached to a System X exchange for an extra charge. This is thought to be the only

satisfactory way of deciding connection priorities.

The Post Office also revealed some of its thinking on future services, with displays on digital local lines, visual services and optical fibre systems.

A scheme is being developed for compressing a moving television picture signal into two megabits per second and using a circuit which normally carries 30 telephone channels.

A joint project with the UK, France and Germany aims to test the feasibility of such transmission over the Orbital Test Satellite this autumn. Under the EEC's Co-operation On Science and Technology project 211, the three partners are developing a code which will combine special filtering and predictive coding with a method of detecting changes between one frame and the next to construct moving pictures from as little transmitted information as possible.

Work is also being done on switching signals sent at one megabit per second, rather than just multiplexing them as is done at present. The Post Office already provides trial facilities

for cable television distribution as part of its experiments on visual services networks, with the possibility of their forming part of a community wideband system with other applications.

The Post Office feels that an essential prelude to the offering of advanced services is international acceptance of the concept of the Integrated Services Digital Network. This means designing all switching and transmission equipment so that as far as possible it can support any service that uses a bit-stream.

IBM letter carrier extended

AFTER 18 months' internal use, IBM has made its electronic mail system available to users running TCAM under VSI or MVS on 370 or 303X systems and having a 3750 or 1750 PABX.

In the first eight months of its internal trial between locations in the UK and the US, the company found that traffic increased from 70 to 700 letters a week. Now the system is to be extended to all European headquarters and the program licence will be available in the UK, France, Germany, Italy and Belgium.

The system, called Electronic Document Distribution, handles text communication between IBM magnetic card typewriters, and these were used to demonstrate it at Communications 80.

Letters can also be sent to the 6640 Ink-Jet printer and further plans are to make the system available on all IBM processors and to add support for other terminal equipment, such as the 250,000 intelligent copier or Document Distribution System.

Setting up a terminal involves inserting magnetic card copies of letters to be collected into the terminal hopper behind a "send" header card, followed by a stack of blank cards, behind a "receive" header card.

The system then tails each terminal in turn to collect the mail before sorting and redistributing it. This is designed to take place at night for greatest economy of system use and line charges, but an "urgent" mode also allows mail to be collected once an hour during the day.

After discussions with other European PTTs, the Post Office reports that acceptance of the concept is good and standards for various parts of the scheme can be expected this year.

Plans for electronic mail were on display. A trial is to start later this year involving 150 terminals in a small number of large companies providing a store-and-forward message service using automatic transmission at off-peak call charge rates. Customers' terminals are to be based on the Racal-ESL communications controller running Teletext Systems file management software.

A national public service is to follow next year, becoming international in 1982 when several countries plan to have Teletext text services running in accordance with standards expected to be recommended by CCITT later this year.

PO approval eagerly awaited for small Canadian PABXs

MANY frustrated business customers are thought to be anxiously waiting for the Post Office approval to be given to the pair of products which Canadian company Mitel had on its stand: two small PABXs.

The Superswitch SX-200 has 208 ports which can be configured as 150 extensions and 29 exchange lines at a cost of £13,000 or less than £100 per extension, when other PABXs cost £400 and £500 per extension.

Approval has been given for offshore operation of the SX-200 and several are in service on oil rigs. It also has approval for operation on leased lines, but not on the public network, although in Italy it has full PTT approval.

The smaller SX-20 can handle up to 72 extensions and eight exchange lines and costs £4,500. Designed particularly for small hotels, it uses CMOS logic and switching to bring the benefits of stored program control to small businesses. Maintenance is simplified because it uses only three main types of printed circuit board.

Approval problems are also experienced by those waiting to buy or sell telephones with advanced features: although the

expectation that the Post Office's monopoly on supply of subscriber apparatus with equipment has led to a brisk trade.

Paul Wilkinson of Cryston Memory Products said that having sold over 300 Lambda Compuhones in the year since he started importing them from Hong Kong, he had placed an order for a further 10,000. They sold at £150, he said, and could store 100 12-digit numbers for abbreviated dialling, could repeat the last number dialled and contained a clock with three time zones and a stopwatch.

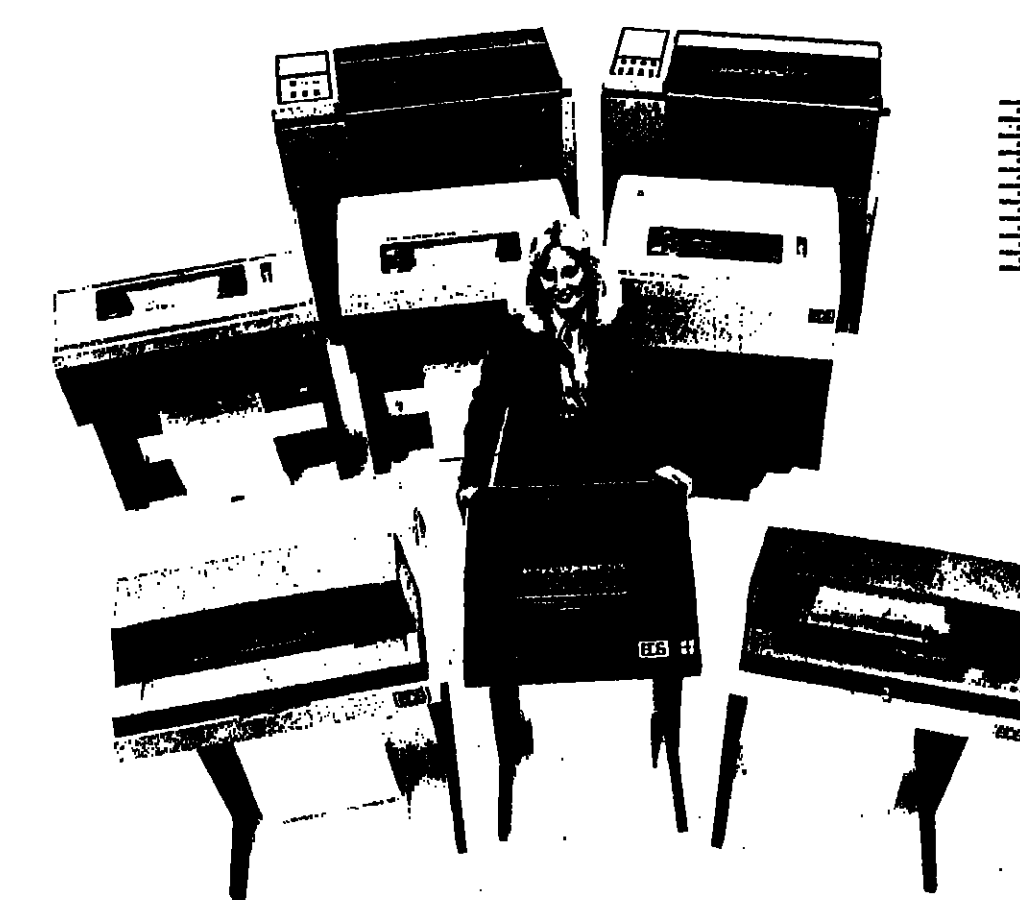
Since a Home Office ruling last October on mobile radiophones, Wilkinson said he had been selling a £1,000 briefcase telephone which could be used via Securicor's services, outside those areas where the Post Office offered a radiophone service and therefore applied its monopoly.

Cordless telephone handsets could not be imported or sold legally, because the Home Office would not grant a licence for the 27 MHz frequency they used, but he understood the Post Office expected to have one on the market by 1982. This might use the 40 MHz frequency, unless Home Office opinion changed.



Siemens showed for the first time in the UK the HP 2080 (above) transceiver which has an Ink-Jet print head and is compatible with CCITT Group 2 standard for transmission in three minutes.

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CTL bids for a share of information technology market



DAVIES... 10% share with option on a further 45%.

CTL, a potentially rich information technology market, Computer Technology Ltd has been restructured and becomes one of the operating subsidiaries of a new group, Information Technology Ltd. Chief executive is Tony Davies, founder and driving force behind Mervin, the highly successful automatic test equipment venture which was taken over by Schlumberger (CW, January 5, 1978).

Davies has taken a 10% share in the group and has a five-year option on a further 45%. This holding will come from the company's Institutional Shareholders, IFC, the Swiss-based Savona Trust, Pergamon Press and Samuel Montagu. These hold 80% of CTL and Davies' acquisition will be on a pro rata basis for each. The remaining 10% of the group is held by employees.

In addition to Computer Technology, where Bob Finch

on established CTL operations for profits and cash but Davies sees CTL as only the first of several subsidiaries that will be formed to cover new markets.

The growth of the group, as projected by Davies, will be 50% a year for the next five years to reach a turnover of £50 million by 1985. Staff would increase over the same period from 380 to over 1,000, and plants and offices would also be expanded.

The aim of the group is to develop workstations for "principals". These are described as units for use by executives, professionals, administrators and clerical staff, as opposed to the more usual word processors used by secretarial staff.

However, the first product planned from CTL will be a word processor due to be launched next year. This is based on research work done by a team of former IBM designers who have been brought together from the UK and the US.

will continue as managing director, a new subsidiary, Office Technology Ltd, under Spud Taylor and based at Winchester, has been set up. Initially the group will depend

BOC names new chief

NEW chief executive of BOC Computer Services is Colin Southgate, formerly chief executive of Software Sciences which was taken over by BOC 18 months ago (CW, December 7, 1978). Southgate takes the reins from Brian Mills who has left the group to set up his own financial and investment service for the computer industry. Under his guidance BOC computer operations grew to one of the biggest UK service organisations with a turnover of £40 million a year.

NEB to sell stake in Ferranti by end of June

THE National Enterprise Board intends to sell its stake in Ferranti by the end of June, but has not yet decided on the details of how this will be done. Company staff are concerned that it should keep its independence after the sale, and so are pressing for it not to be sold to a single bidder.

To avoid the possibility of a takeover, a large share could be sold to an institution.

Unilever Computer Services celebrates 10 years of growth

TEN years of growth and expansion are being celebrated by Unilever Computer Services Ltd, the computer subsidiary of the Unilever foods and soap conglomerate.

Set up in 1970 by merging three in-house operations run by Unilever companies, UCSL now has centres in Burgess Hill, Sussex, and at Watford, using Nasco ASs, and a third centre at Norwich where IBM 360 kit is soon to be replaced by 4300 systems. A fourth centre due to open on Merseyside later this year will have an AS5.

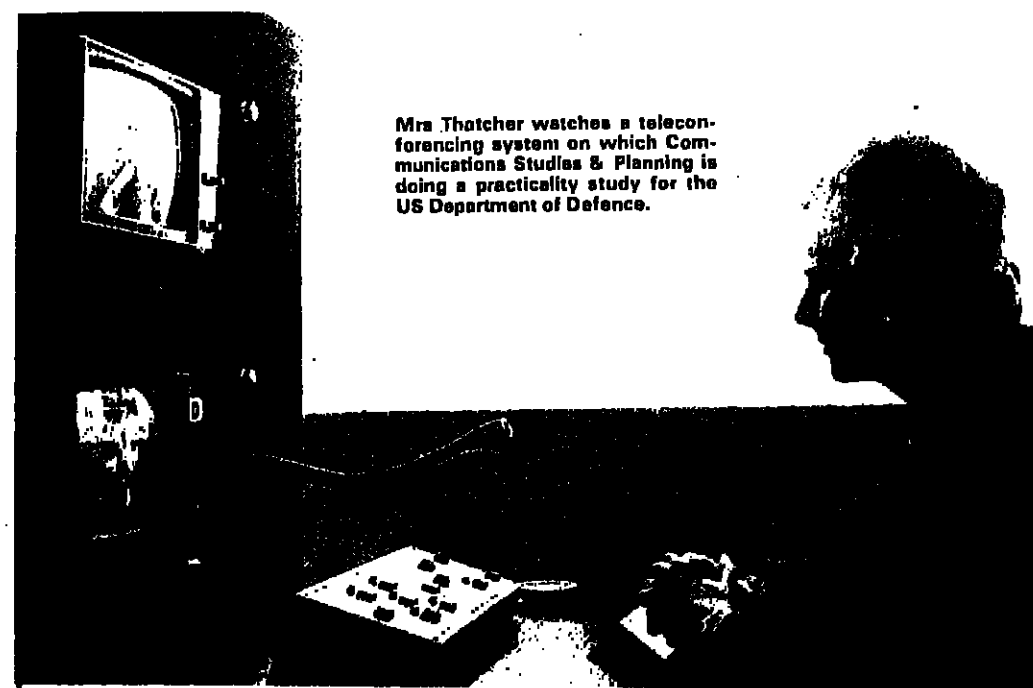
There is also a microfiche service in the City and UCSL has a third share and is responsible for managing Tymshare UK, the British end of the US time sharing and information network.

Reviewing progress, chairman Len Rawle, who was responsible for getting UCSL off the ground, said that from the start they had been in the open market, having to bid for Unilever work as well

as that from other clients, and these now accounted for 64% of the business. First profit had been shown in 1972, a year ahead of plan, and over the five years 1975 to 1979 turnover had increased from £3.4 million to £12.8 million, with before tax profits rising from £500,000 to £1.25 million.

Data services accounted for 65% of turnover and within the division specialised services were offered for accountancy, insurance and pensions, engineering and text processing.

One of the latest ventures was UCSL Microsystems which had introduced a range of micro-based hand-held terminals which could be tailored for a number of applications. The M55 was the company's first completely in-house designed and developed unit and Rawle saw expansion in this field and the provision of wider communications based services as the growth path that UCSL would follow during the next decade.



Mrs Thatcher watches a teleconferencing system on which Communications Studies & Planning is doing a practical study for the US Department of Defence.

Mrs T comes to terms with computers

IT is quite an achievement for an industry to grab the attention of the Prime Minister for a whole morning, but the computer business did just that when Mrs Thatcher visited software houses Logica and Communications Studies & Planning. The PM's enthusiasm fairly bubbled when shown high technology products in which Britain leads the world.

"We do a lot of this business, we're very good at it, and we're trying to compete," she asserted. At Logica she had her first

glimpse of Prestel, eagerly studying the graphical displays of the growth of the money supply.

She lost her patience watching a "missionaries and cannibals" game, though, finally asking "Why can't we shoot a cannibal?"

The Prime Minister was most impressed by Logica's image processor for colour satellite pictures, which she said would be useful for watching crop diseases, and for defence. The new 2200 word processor also

aroused her excitement, especially for rewriting speeches. She left Logica to a patter of applause from bystanders, a request for an autograph from a girl — and a chorus of jeers and catcalls from the sorting office workers in the sorting office yard across the road.

Data General launches long-awaited 32-bit machine

THE long-awaited 32-bit machine from Data General has now been launched as the MV/8000. It can run programs developed under ACS on 16-bit Data General machines without modification.

Data General emphasises the high degree of compatibility between the MV/8000 and existing 16-bit Eclipse machines and points out that this compatibility provides the user with a broad range of scientific and commercial software. The MV/8000 looks like being promoted much more heavily in the commercial sector than existing 32-bit "super" minicomputers.

The main software offering with the MV/8000 is the ACS/V5 operating system which, according to Data General, takes advantage of the machine's architecture to manage system resources for up to 128 users each accessing up to 512 megabytes of logical address space.

Three different processors are included in the MV/8000, with the option of a fourth, a Nova, as communications processor. The arithmetic-logic unit is a 32-bit

processor using AMD 2900 series bit-slice microprocessors and programmable array logic in the peripheral circuitry. It has a 16K-byte data cache and a 1K instruction cache, and uses a four-stage pipeline.

The other processors are a 64K-byte Eclipse used as the input-output and a Micromova used as the system control processor.

Harris offers micro-based information processing family

EXTENDING its equipment line more firmly into information processing, Harris Systems has introduced the microprocessor-based 9200 family.

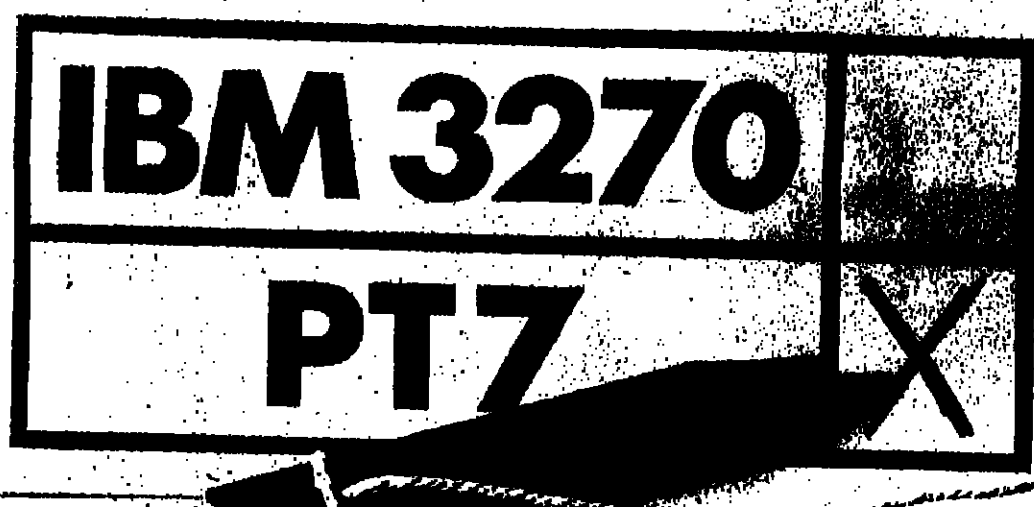
Designed to be compatible with IBM's 3270s and to replace the 8100s taken over from Sanders Data Systems (CW, February 17, 1977), the first 9200 model, the 9210, is scheduled for delivery in September. The first UK order, placed by a company in the north of England, is for four 9210 controllers supporting 54 displays.

The instruction set is a super-set of that in the Eclipse and 16 and 32-bit programs can be executed concurrently. New 32-bit Assembler language compilers for Fortran 77 and PL-1 feature common code generator and optimiser enabling subroutines to be shared between programs using either language. A new 32-bit Basic is also offered.

First introduced in Europe at Hannover Fair, and making its US debut at the National Computer Conference at Anaheim, California, the 9200 incorporates the Intel 8086 and up to six can be loaded into each controller giving a 2 Mbyte memory capacity and the capability to support up to 32 devices.

The 9200s have been designed to enter the market 10% to 15% below IBM prices and a basic system with four VDUs and a printer would cost about £12,000.

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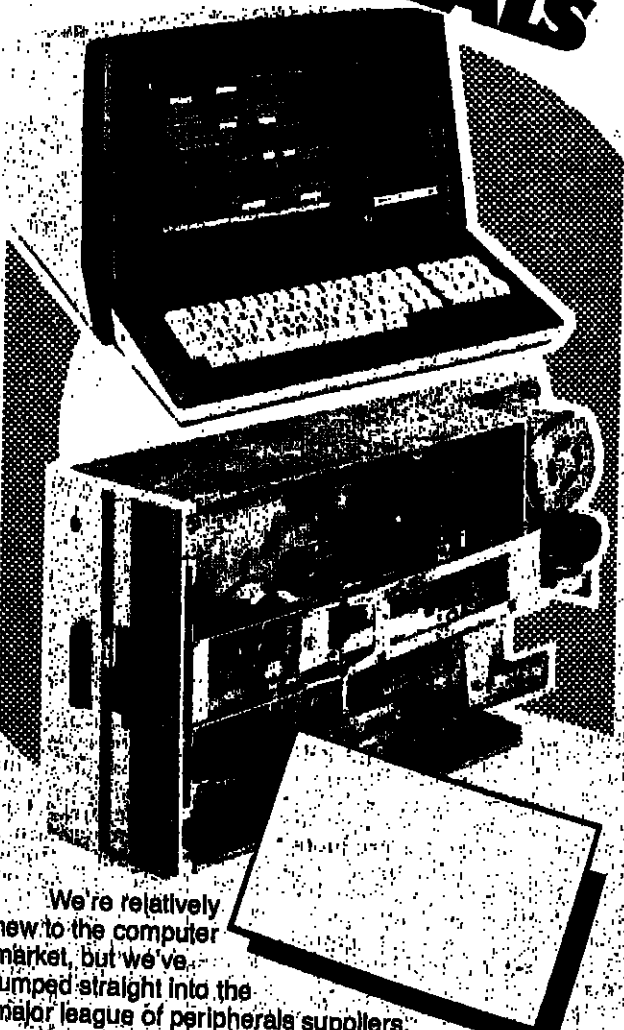
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Post Office changes to British Telecom

THE Post Office has started to use the name British Telecom for its telecommunications activities in preparation for the planned creation of a separate corporation by Act of Parliament.

Managing director Peter Benton said that the new name and style would make it clear that the business had been rejuvenated while the new management structure pursued its eight-point plan to improve services.

The plan includes a radical reform of buying and distribution procedures to reduce delays and plant renewal in local network troublespots, using new jointing techniques to prevent

deterioration and optical fibres where ducts were overcrowded. New computer-based measurement and analysis centres aimed at spotting faults as they occur are to be introduced at the rate of three a month until every exchange with over 1,000 lines has one.

By the end of the year 80 TKE4 electronic exchanges will have been added to the 60 already in service.

This plan calls for an investment of £1,500 million a year, which Benton says is clearly close to a minimum when compared with the French plan to invest £2,500 million a year.

ICL plans experimental retail selling exercise

ICL is reviewing its marketing methods, and is planning an experimental retail selling exercise. This was revealed to ICL users by Doug Comish, ICL marketing director, at the ICL CUA conference at Eastbourne.

Comish was stressing ICL's intent "to compete strongly in markets for smaller products used by non-specialists". He anticipated that customers for these products would wish to order equipment by catalogue, or by going to a retail outlet, hence the planned experiment.

Comish also revealed that ICL was doing a lot of research work into speech response systems,

and said it had developed a method of storing compactly vocabularies of several hundred words.

ICL managing director Chris Wilson, made a strong appeal for reality in government and EEC policies towards local supplier preference. He stressed the need to ensure an independent supply of the two most important resources, energy and computer systems.

He then pointed out that the proportion of US owned companies operating in Europe was now 82 per cent, and predicted that "the Japanese invasion cannot be long delayed".

Plato training centres

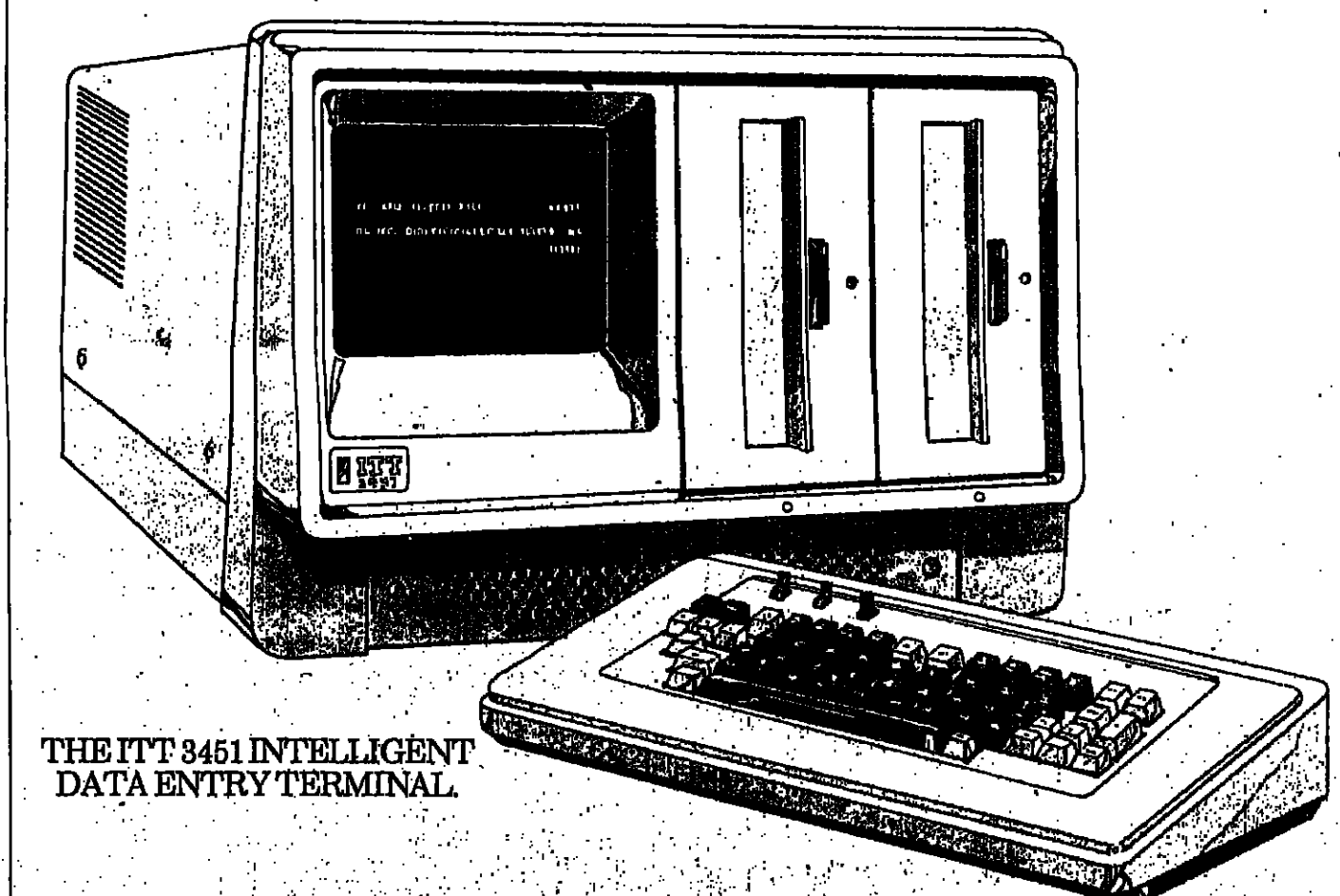
FOUR training centres have been opened in the UK by Control Data to enable people to use the Plato learning system, without having to acquire their own terminals. Centres are in London, Bristol, Manchester, and Birmingham, using a dedicated Cyber 730 in East Barnet.

Users will pay about £7 to £10 an hour for training, part of which uses CDC's high resolution intelligent VDU, and part of which is in printed form. Four

courses are currently offered, in microelectronics, selling, supervisory skills, and career development.

Systems house Logica is thinking of using Plato to train staff for its projected word processor factory in Swindon.

The London centre was officially opened by Industry Secretary Sir Keith Joseph, who commented, "The idea does not that new technology destroys jobs."



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COMPUTASTARS



Midland Household Stores ladies' team won at Birmingham (left to right) Jill Hesketh, Anne Harriman, Judy Armstrong and Monica Cann.

Standards 'higher than ever' in hard-fought heats

THE three last regional heats of Computastars have now been held — the Northern heat at Cleckheaton, the Midlands heat at Birmingham and the London heat at Barnet.

"It is still a wide-open con-

test," said organiser Gordon Cairns. "The heats have all been hard-fought, and the standard is higher than ever."

"The competitors are marvelous this year. When the standards for all the meetings are equated, only 35 points separate all the finalists. And, as an example of the high standard set, already eight people have completed the 400 metre steeplechase in less than one minute. This is a very good time even for a race on the flat, but the steeplechase included a water jump."

Computastars is sponsored jointly by Computer Weekly and Wright Air Conditioning. The first Dutch heats, organised by the Dutch magazine Computable, have been held this year, and the entry is high — altogether 40 teams have entered. "They're very keen," said

Cairns, "and will make strong competition for the English teams."

One Dutch heat has already been held, and the second will take place this Saturday, June 14, at The Hague. The top six male and six female teams will come to the final.

No Scottish or Welsh teams have entered Computastars, and although some Northern Ireland companies were talking in 1979 about sending teams this year, none has done so.

There have been some surprises. The Legal and General men's team, which came fourth in the Crystal Palace final last year, only made ninth place in its regional heat at Barnet this year. And the individual male winner for the last two years, Martin Rigby, was second in his regional heat at Cleckheaton, although, says Cairns, he has had some cartilage trouble and will probably pick up later.

The final will be held in September at the New Alexan-

dra Stadium, Perry Barr, Birmingham.

RESULTS

London

Men's team events — 1. National Provident Institution, 247 points. 2. Segas, 224. 3. B. H. Blackwell and CMC, both 208. 5. RAF and Surrey County Council, both 203.

Ladies' team events — 1. Legal and General, 236 points. 2. Thorn EMI, 230. 3. Segas, 203. 4. London Transport, 180. 5. Easams, 179. 6. Royal Borough of Kensington and Chelsea, 150.

Men's individual events — 1. Dave Cross, National Provident, 80 points. 2. Chris Paddon, RAF, 88. 3. Colin Langstone, Easams, 83.

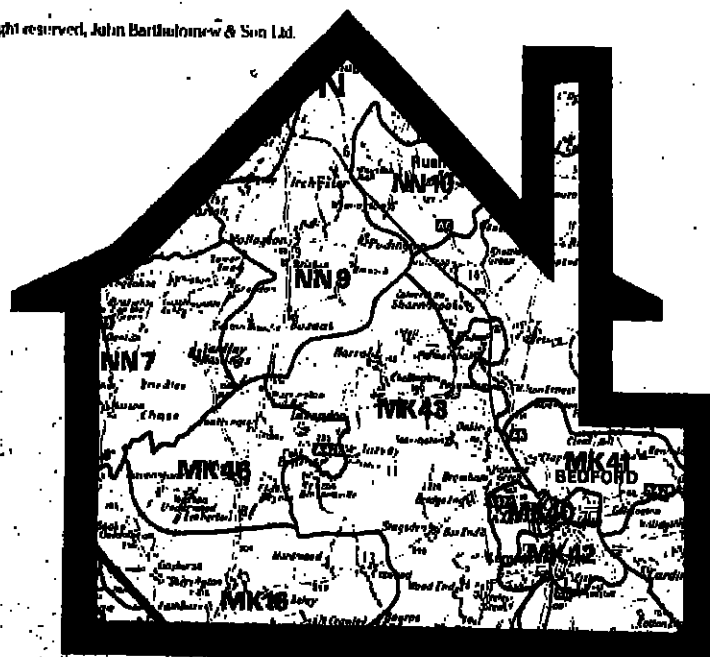
Ladies' individual events — 1. Bridget Cuthill, Legal and General, 89 points. 2. Sue Howells, Thorn EMI, 87. 3. Louise Cotter, Segas, 77.

● Turn to page 25



Competition in the children's race at Cleckheaton was just as enthusiastic as in the adult events.

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The winning Midlands men's team from Mettoy: (left to right) Nigel Stanton, Martin Pearce, Roy Evans, Ian James and Richard Lewis.



The individual winners in the London heat, held at Barnet, display trophies and winning smiles. Dave Cross of National Provident Institution and Bridget Cuthill of Legal and General also captained the winning teams in the team events.



The two winning teams in the London heat: men from National Provident Institution and women from Legal and General. (left to right) Dave Cross, David May, Dave Cross, Bridget Cuthill and Mike Taylor. (left to right) Bridget Cuthill, Bridget Cuthill, Anne Briggs, Mandy Smith and Sue Mason.

The Northern, Midlands and London heats



Events and non-events at the water jump in the men's steeplechase at Cleckheaton.



Results of heats

● From page 24

Midlands

Men's team events — 1. Mettoy, 278 points. 2. Midland Household Stores, 259. 3. BL Systems, 237. 4. Safe Computing and Woolworths, both 233. 6. Rank Toshiba, 231.

Ladies' team events — 1. Midland Household Stores, 219 points. 2. Safe Computing, 192. 3. Metal Box, 186. 4. Thorn EMI, 175. 5. Norwich Union, 163. 6. Systems Resources, 95.

Men's individual events — 1. Martin Pearce, Mettoy, 98 points. 2. P. Ellis, Midland Household, 91. 3. Tim Thickett, Woolworths, 88.

Ladies' individual events — 1. Anne Harriman, Midland Household, 80 points. 2. Jacqueline Read, Metal Box, 74. 3.

Angie Dunstan, Safe Computing, 68.

North

Ladies' team events — 1. Rowntree Mackintosh, 232 points. 2. Reckitt & Colman, 194. 3. United Biscuits, 190. 4. Littlewoods, 155. 5. Compover, 118.

Men's team events — 1. Data Logic, 266 points. 2. Compover, 243. 3. Rowntree Mackintosh, 240. 4. United Biscuits, 236. 5. Computer Data Services, 218. 6. Inland Revenue, 216.

Ladies' individual events — 1. Anne Shafto, Rowntree Mackintosh, 98 points. 2. Lucy Baines, United Biscuits, 73. 3. Lesley Smith, Littlewoods, 71.

Men's individual events — 1. Geoff Linell, Rowntree Mackintosh, 92. 2. Martin Rigby, Rowntree Mackintosh, 89. 3. Jack Cook, Compover, 84.



The ladies' team sprint event in the Northern heat at Cleckheaton.



The Rowntree Mackintosh ladies' team who won at Cleckheaton: (left to right) Louise Francis, Joanna Cartledge, Dawn Hambling and Anne Shafto.

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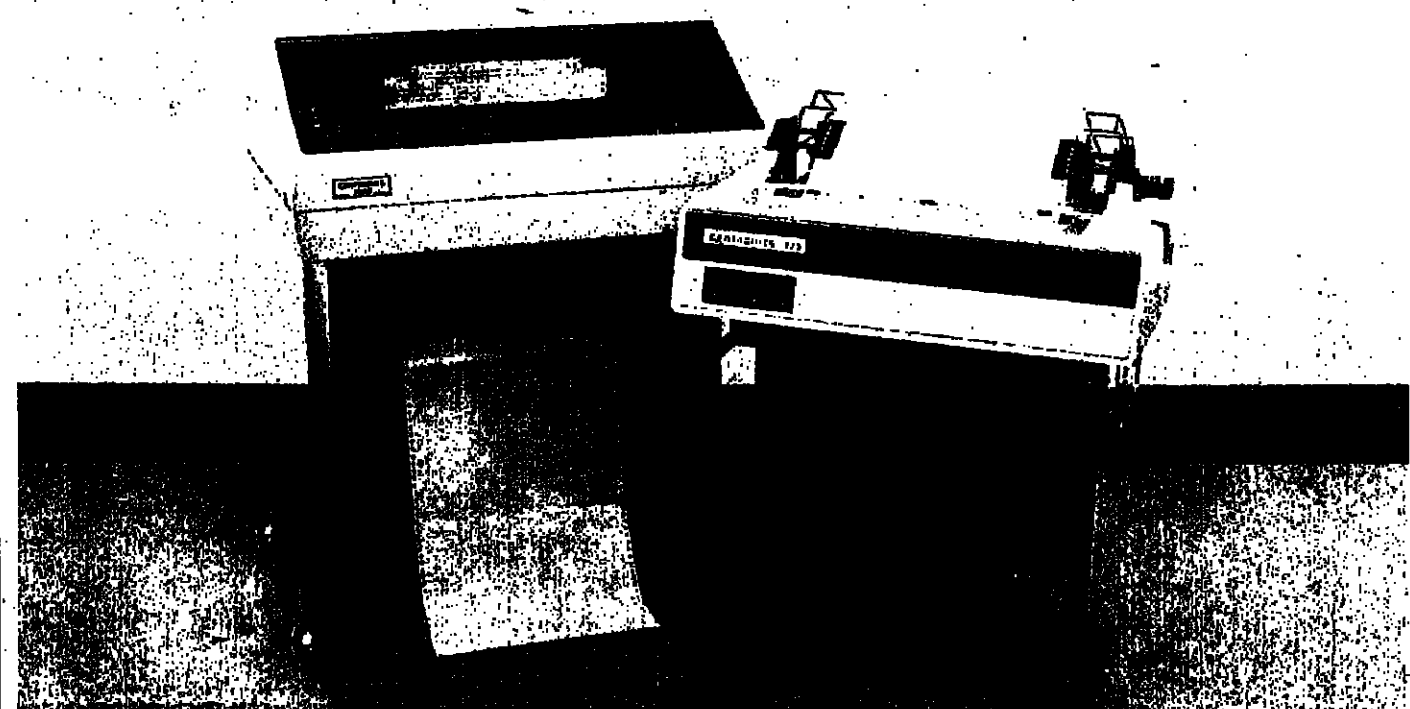
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HANOVER FAIR

A window on the Comecon countries

HANOVER FAIR provides one of the few opportunities for Western observers to catch up with what is happening in Eastern Europe, as most of the Comecon countries, apart from the Soviet Union, exhibit in the computer hall. This year, Robotron of East Germany and Videoton of Hungary reported significant advances.

The latest microprocessor from Kombinat Elektronik, the East German chip factory (CW, March 20) appears to be a bit-slice micro 8 bits wide. Although the U880 is based on the Intel 8080 and Z80 micros, the U830 appears to be an original design not based on any existing US product. It includes arithmetic logic unit, eight registers and status flags, and two are used in Robotron's new K1620 minicomputer which features a new set of 400 instructions, incompatible with the previous Robotron 4000 series of minicomputers. It is unclear whether it is compatible with the new Rjad unified range of minis, which is similar to the PDP-11 line.

At Hanover it was exhibited as a system called A6401, featuring an additional chip for floating point arithmetic. Also on show was a synthesised voice system based on programmed memory chips.

Language is also talking of putting four U830s together to make a 32-bit processor. Theoretically this could be made compatible with the Rjad-2 line of mainframes which is based on IBM's System 370 line, but it is unclear whether this is in the Robotron plan.

The other new processor alongside the K1620 is the K1520, based on the U880 eight-bit microprocessor. This is claimed to have an internal cycle of 420 nanoseconds, and like the Z80 addresses up to 64K-bytes.

Among the products based on the processor is an A5201 accounting machine, which comes with either the Robotron 40-chips daisy-wheel printer or a tabling matrix printer running at 180 chps. Text processing software is in development. The array of peripherals supported includes up to four floppy disc drives, one printer, two tape cassettes and a display. First shipments are not due until the end of the year, and in East Germany such target dates tend not to be met.

The same processor plus peripheral controller is used in the A5203 data entry terminal.

Over at Videoton, the Hungarian company was displaying examples from its enormous range of VDT 52000 series display terminals, which are based on the Intel 8080. Versions are offered with integral floppy discs, integral cassettes, and with IBM 3275 and Siemens Transdata compatibility.

The standards for Teletex have not yet been set — the CCITT is due to do this later this year — so the Germans have worked out provisional standards of their own.

Philips was demonstrating this using a BTS minicomputer to interface its existing P6002 word processors to the Bundespost network and a switching computer in Munich. An A4 page could be transmitted in seven seconds. Philips is developing a purpose-designed Teletex terminal which it expects to sell in hundreds to the Swedish Post Office over the next two years. The Swedes are thinking about setting up a whole new network for Teletex in their own country.

SEL also had a prototype Teletex terminal on its stand

Successful East-West collaboration

THE most successful East-West computer collaboration is that between the Hungarian company Videoton and CII of France, and its successor SEMS.

Videoton is building the full current line of SEMS Mitra minis. The Mitra 115 is built as the VT 60, the Mitra 225 as the VT 80, and the new Mitra 525 as the VT 6000. This last machine uses the high-speed Motorola 10800 four-bit bit-slice micro-processor as the basis of the CPU.

The VT 6000 appeared at Hanover last year a few days before it was even announced by SEMS as the Mitra 225 in France, and is now in series production in Hungary. Series production of the VT 6000 begins next year.

Videoton is building about 25 processors a month and its minicomputer business is worth about 1,500 million Forints, which has a nominal commercial value of £20 million.

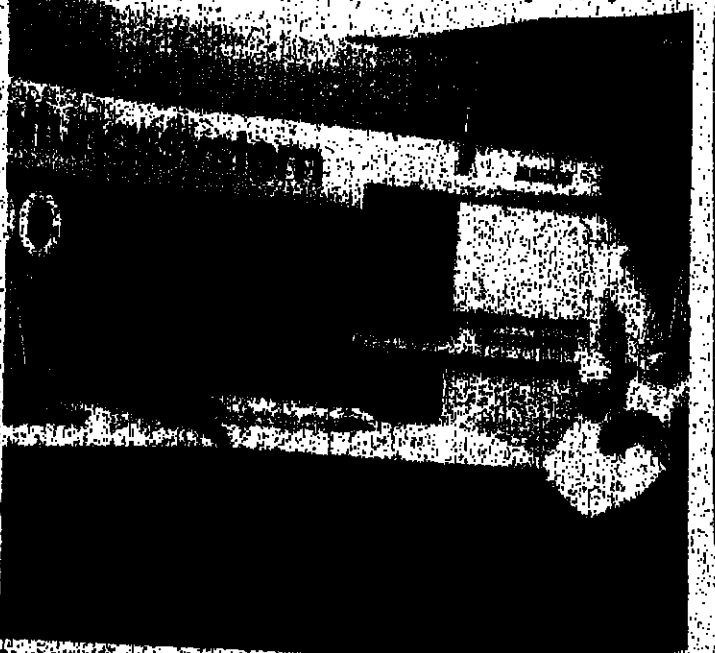
which marks a dramatic advance in Robotron styling, being a very attractive-looking keyboard display station with built-in floppy.

Language available on the K1520 — which is also offered as a microcomputer in its own right, capable of supporting three further slave K1520s — is Intel-compatible assembly, while a Basic compiler is due shortly, and a mini-Cobol is planned for next year.

The new products are being offered to the existing Data agents in the West, which have been successful with the Robotron/Daro VRCA.

The key question about the new Robotron products is that of the yields that Kombinat Elektronik is getting on its microprocessors and memory chips. Although these are not likely to be high, the volumes of products produced in Robotron factories are sufficiently small that low yields are not likely to be a limiting factor, provided they are above sample quantities.

Over at Videoton, the Hungarian company was displaying examples from its enormous range of VDT 52000 series display terminals, which are based on the Intel 8080. Versions are offered with integral floppy discs, integral cassettes, and with IBM 3275 and Siemens Transdata compatibility.



Japan steals a march on Western products

"THE Japanese invasion" — that was the overwhelming impression visitors had of Hanover Fair, where over 40 companies from the Far East were exhibiting not just new products for office systems, but new technology. Instead of simply copying Western products, the Japanese are introducing equipment well in advance of anything currently available elsewhere.

Prototype machines on display and working included several intelligent copiers (xerographic printer-copiers that can be used for fast, high-quality word processing output), a colour facsimile machine, a true electronic copier in which there is no optical, only electrical, connection between the read and write mechanisms, and a high-resolution full-page display screen. Ink jet technology has been advanced enough to be used in a two-colour copier and in a high-resolution printer capable of generating Japanese characters.

None of these machines is yet on the market but most will be by the end of 1980, presenting Western component manufacturers with serious problems over how to keep up. As far as printer-copiers go, only two are currently available: IBM's is very big and expensive and there have been widespread problems in getting Wang's on to the market. It was not even on show at Hanover this year. In contrast, one of the Japanese machines is small and simple enough to be a desk-top unit.

Not many new end-user word processing products were to be seen at Hanover, but those that were, were important. Nexos unveiled an upgraded version of its stand-alone word processor, designed for use by secretaries, not just typists, and based on a 16-bit micro to give improved performance and plenty of capacity for expanded facilities. Nixdorf had a machine that can be either stand-alone or shared logic, and discussed plans for integrating WP into its office data processing systems.

Sony revealed that it will be announcing a word processing product later this year, without giving any further details.

Triumph-Adler has entered the low end of the word processing market with this electronic typewriter, the BE1010, using a daisy wheel printer.



Impressive line-up

THE detailed line-up of revolutionary Japanese products was this:

● Ricoh demonstrated an electronic printer-copier with separate read and write engines, in effect a high-speed, high-quality facsimile system. This was capable of combining images from a scanning station with text from a word processor on to the same output document. The images could be held in a buffer store, and even be moved about on the paper, according to a program by which co-ordinates were specified. Enlarging and reducing of image size is not yet available, but is to be incorporated in future models. The printing was done by laser scanning on to a xerographic drum.

● Canon released details of a laser printer small enough to fit on a desk, which can therefore be expected to have an appropriately low price. This was developed at Canon's Advanced Technology Department in New York State.

● Mitsui's high-resolution screen displayed 96 characters horizontally by 64 vertically, all on a 15-inch tube. Each character was a 7 by 9 dot matrix, allowing for subscripts and superscripts. A slightly larger screen with the same performance would be attractive for word processors.

● Sharp showed samples of output from an ink-jet printer, developed for Japanese word processors, which uses a 24-square dot matrix to reproduce Japanese characters attractively. The character generator can hold 2,000 different symbols, enough for 99% of Japanese writing.

the U-Bix copier on which Wang's Image Printer is based.

● Panasonic demonstrated a full-colour facsimile system which took two minutes to transmit an A4 page. This also used ink-jet recording, with four colours of ink: red, yellow, blue and black.

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Teletext on show

ATTENTION was diverted back to the European scene for a demonstration of Teletex by the German Bundespost in conjunction with several manufacturers: Philips, Siemens, Triumph Adler, Standard Electric Lorenz, and Olympia. Teletex is a high-quality Telex service, providing such features as upper and lower case and store-and-forward in effect providing a packet-switched network of communicating word processors.

The standards for Teletex have not yet been set — the CCITT is due to do this later this year — so the Germans have worked out provisional standards of their own.

Philips was demonstrating this using a BTS minicomputer to interface its existing P6002 word processors to the Bundespost network and a switching computer in Munich. An A4 page could be transmitted in seven seconds. Philips is developing a purpose-designed Teletex terminal which it expects to sell in hundreds to the Swedish Post Office over the next two years. The Swedes are thinking about setting up a whole new network for Teletex in their own country.

This represents a significant new venture for SEL, which has not hitherto been involved in word processing. Development work has been going on within SEL's parent, ITT, for a while now, and experienced staff, such as Logica's former head of word processing development, John Farnell, have been taken on board.

Word processing is one of the options available on Philips' new P6000 personal computer. Plus-in ROMs convert the machine alternately into a WP, a computer with Basic or Pascal, a videodata terminal, or a games playing device. An optional VDU with mini-floppy discs sits above the keyboard on a frame; without this the program can be stored on minicassettes, the drive for which is built into the basic unit. Prices range from about £600 to over £3,000.

The new Nexos word processor is called the 2200, and like its predecessor the VTS-100 is built by Logica. However, the specification came from Nexos, whereas the VTS-100 existed before the new firm was founded. In the same way, the new machine is based on the Intel 8080 8-bit micro, allowing up to 256K-bytes of store. The basic 2200 will have 128K-bytes.

Reports by Tim Palmer and Rory Johnston



The housing of the Nexos 2200 word processor has been designed to fit unobtrusively on a secretary's desk, so it can be used as a future office system work station.

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ADVANCED FILE DESIGN—Part 9

by Owen Hanson and Norman Revell

Improvement and optimisation

SOFTWARE provided by manufacturers is aimed at meeting the needs of a very wide spectrum of users. This leads to a general approach to any given problem; the specific requirements of any one application could be handled more efficiently in some other way, at the expense of other users. This has led to the identification of a number of weaknesses in manufacturers' software that have been remedied by independent software sources.

Because it is very widely used, ISAM has been the subject of most improvement. The weaknesses in ISAM can be summarised as the use of too much space, and loss of time. The reasons are as follows:

Space

1. Records are unblocked in overflow areas, which means that the file requires more direct access space than if records were blocked.

2. Large user keys may be appropriate for a particular application, but this will increase the size of the indices, allowing less room for data storage.

3. Applications requiring both sequential and direct reference will need two separate ISAM modules in main storage. This can use up to 47K, and may limit the space available to the user program.

Speed

4. Overflow records require longer retrieval times than prime data records. This leads to the need for relatively frequent reorganisations to limit run times.

5. During sequential processing, a record may not be processed until the next record has passed the read/write heads. A complete disc revolution will be required before the record is available once more.

Various suppliers have provided software that improves on ISAM in one or more of these areas. The Amiga package provided by Comtan (UK), focussed on points 1, 3 and 5. PSAM, marketed by Westinghouse Management Systems Division, concentrates on points 1 and 4 by handling additions in the prime data area. This is claimed to reduce disc I/O time in comparison with an ISAM file that has records in overflow.

It also implies that less frequent reorganisations are required, and less disc space is used because additions are held in blocked form. It is worth pointing out that ICL's 1900 series indexed sequential software does allow the user to specify a packing density for data in the prime data buffers, and so can avoid or drastically reduce the need for separate overflow areas by leaving free space in the data area of the file.

These instances of improved software can lead users to assume that it is always possible to improve on the performance of a given file. In many cases this is true, but it does not always mean that the user should first check the manufacturer's software has been fully optimised, using any options that are provided.

Coyle examined the performance of an ISAM file in detail, and implemented a series of measures that improved throughput by more than four times. This is shown in Diagram 1. He concluded that alternative solutions did not offer a better solution for his application.

IBM decided to improve on ISAM, and developed VSAM, Virtual Sequential Access Method, which takes as input account points 1, 2, 4 and 5. In addition, it allows the user to define files without considering the physical make-up of the direct access storage being used, and to transfer files between different OS/VS operating systems and from OS/VS to DOS/VS.

The structure of a VSAM file is shown in Diagram 2. In setting up such a file, a key-sequenced file or data set is created, with its associated indexes, as a cluster. For our purposes the cluster is an indexed file.

Data storage is divided into control intervals, which are continuous areas of storage of a size that it not necessarily related to the physical make-up of the device on which the data is stored. This is shown in Diagram 3. A control interval is the unit of data that is moved between virtual and backing storage. In a sense it is equivalent to a track in an ISAM file, in that there is one index entry per control interval.

A group of control intervals makes up a control area. The

whole of a control area is referenced by the entries in a single index record, and in a sense this is equivalent to a cylinder in ISAM terms.

Indices are arranged as follows. All the higher indices are collectively called the index set, and they are divided into index records containing a number of pointers. One of these pointers indicates the next index record at this level, and is used to move sequentially through the file.

The other pointers indicate the location of a number of index records at a lower level. The lowest level of index records makes up the sequence set, and in this case the pointers are to control intervals; the total number of control intervals indexed by one index record makes up a control area.

Additions to the file are catered for by the provision of distributed free space. This can be allocated by allowing a number of control intervals to remain entirely empty, by leaving space at the end of every control interval that contains data records, or by a combination of both techniques. As all the space available in a control area is allocated when the file is set up, VSAM provides the equivalent of a cylinder overflow area in ISAM, and a proportion of free space in data storage areas, as used in ICL 1900 series software.

Records added to a file are blocked in just the same way as the original data, and not unblocked as in ISAM. VSAM does

8000 transactions/hour — Original throughput

• New records added in descending order

• Dummy records to handle future additions

12000

• Addition of a master index

16000

• Master index held in main storage

22000

• Cylinder index held in main storage

28000

• Binary search of in-core tables replaces manufacturers routine (user modification)

38000

Diagram 1. This illustrates a series of measures devised by F. T. Coyle to optimise throughput of an ISAM file.

not leave deleted records in the data area, as does ISAM. The area occupied by the record or part of a record that has been deleted is added to the distributed free space available.

When records are inserted, a control interval split takes place under VSAM control. If there is not sufficient space for the inserted records in the control interval, this uses any free control intervals in the control area, rather than the free space in other control intervals containing data. The consequence of this is that the records may not be physically in sequence after a control interval split, although they will be handled in sequence by the indexes.

If there is not sufficient room in the control area to handle all additions, a control area split takes place under VSAM control. Approximately half the control intervals in the old control area are moved to the new control area, which is made available either as a result of decisions made when the file was defined, or by extending the

file as required. The new control area is likely to be physically remote from the original site of the data. Although VSAM will handle it sequentially, the situation is similar to that of providing an independent overflow area in ISAM, and should be avoided whenever possible.

VSAM provides the possibility of holding alternate indices, so the user can reference a file in different sequences using a number of different keys. Alternate indices can be updated when records are added or deleted, by specifying UPGRADE in the alternate index definition. Keys in all VSAM indices are compressed, only the distinguishing parts of the keys being stored, in order to reduce the size of index entries.

These facilities make VSAM more similar to database software than most of the file organisation techniques that have been examined so far, in fact many of the database systems available for mini- and micro-computers provide only this multiple index facility.

VSAM can be optimised by careful design, applying the same principles that have been described earlier. The designer should look at the following factors:

1. The relation of data areas and index position to the physical characteristics of the device. The portability of a VSAM file from one device to another, and from operation under one OS/VS system to another, or from OS/VS to DOS/VS is helpful in providing rapid conversion.

However, for optimum performance the size of control intervals and control areas should be so arranged that a sequence set record will be stored on the same cylinder as the control area it indexes. This means that movement from, say, a 3330 to a 3380 will require the definition of new control area sizes unless the number of control areas on a

cylinder has been designed to take account of this change of disc in the future.

2. The size of the buffers provided for VSAM directly determines the number of higher index records held in virtual storage (as against backing storage). Hence buffers should be both as large as possible, and related in size to index record size.

3. Distribution of free space. The ability to define empty control intervals where they are required means that careful planning with a knowledge of the likely distribution of additions will reduce the need for control area splits, and possibly control intervals splits. This will improve performance.

In conclusion it is worth pointing out that indexed sequential files are often taken for granted, because the manufacturers provide comprehensive software. Optimisation of this software can bring very substantial benefits. In some cases software from independent suppliers will be more suitable, because its design aims match the need of a given application. Professional file designers should be in a position to optimise manufacturers' software and decide when to try alternatives.

VSAM is a departure towards database software. In following parts we shall examine the development of this software, its advantages and penalties.

REFERENCES

1. The Hidden Speed of ISAM, by F. T. Coyle, 'Datamation', June 1971, 48-49.

BASIC FILE DESIGN

A new impression of Basic File Design is now available and copies may be ordered from the General Sales Manager, IPE Electrical and Electronic Press Ltd, Dorset House, Stamford Street, London SE1 8LU. Price £1.90 each including postage.

Expert systems group meeting

THE British Computer Society has formed a Specialist Group in Expert Systems, and its first meeting has been organised under the heading Expert Systems: Practical Applications of Knowledge Engineering.

The meeting is jointly sponsored by the BCS Information Retrieval Specialist Group and will include a paper by Professor Donald Michie on expert systems and the industrial future. Professor Michie is head of the Machine Intelligence Research Unit at Edinburgh University. John Fagan of the MRC Social and Applied Psychology Unit at Sheffield University will give a

paper entitled The Expert Clinical Assistant: a case study, and expert systems in management decision making will be the subject of Bernard Kelly of ICL. John Reiter, also of the Machine Intelligence Unit at Edinburgh, will speak on an inference net for diagnosing oil platform faults.

The meeting will take place at Imperial College, London on June 27 at 11 am. The registration fee £20 includes one year's membership of the group. It should be sent to Dr Keith Clark, Dept of Computing and Control, Imperial College, 180 Queen's Gate, London SW7 2BZ.

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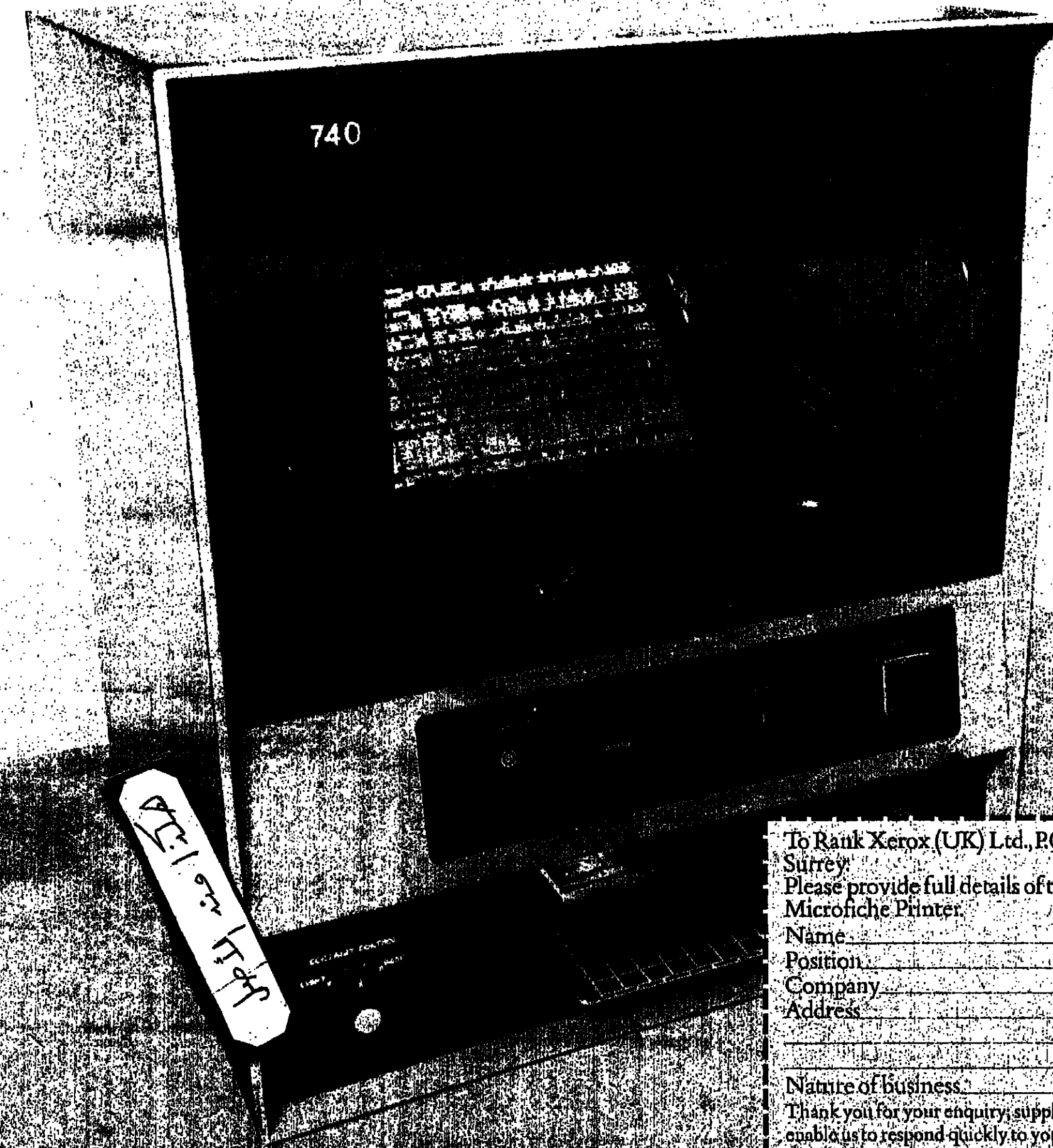
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International Bank utilising IBM SYS 3 series machine currently require a programmer with approximately one year's RPG II experience. Preference will be given to applicants with IBM experience although this is not essential. As well as an excellent salary all usual Banking perks apply.

PROGRAMMER COBOL to £9,000
CITY
A City-based financial installation, using an IBM 370 machine but shortly changing to 4331, require a Cobol programmer with a minimum of 18 months' experience, which must include sound knowledge of DOS and CICS. This is an excellent opportunity to join an expanding department and become involved in all aspects of systems and programming.

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A Chief Programmer is required by a medium-size Burroughs installation based in C. London. A minimum of 4 years' Cobol programming including knowledge of Burroughs Medium Systems is essential. The successful applicant will be responsible for a team of 6 programmers and will enjoy a lively and friendly working environment. Benefits include an annual bonus, subsidised meals, B.U.P.A., etc.

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One year's experience, COBOL language, commercial applications. Preferably ICL background. Manufacturing environment.
£Negotiable SYSTEMS ANALYST Cambs EM809
To develop new systems and enhance existing systems using minis and IBM mainframe. Knowledge of programming an advantage.
To £9,000 SENIOR PROGRAMMER Peterborough EM808
5 years' IBM COBOL experience. Financial/business background. Some supervisory experience.
£Negotiable PROGRAMMER Warks EM800
2-3 years' commercial, financial or manufacturing programming experience, preferably COBOL language.
£Negotiable ANALYST/PROGRAMMER Coventry EM796
Involved in the development of on-line database systems. 3 years' experience and knowledge of COBOL language. Manufacturing environment. Consultant: Margaret Brace.

MIDLANDS & NORTH WEST

£7,500 SENIOR PROGRAMMER West Bromwich B902
COBOL and RPGII experience required for mainframe IBM installation. CICS and DLI advantageous, not essential.
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To £9,000 PROGRAMMERS Birmingham 5/817
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Our client, a leading International Programming and Systems House based in Central London, has an urgent requirement for project team specialists. Above-average salaries will be paid to ambitious, proactive candidates who enjoy involvement with customers in developing their systems and solving their business problems. Successful candidates will probably be graduates with a minimum of two years programming experience on any commercial machine whilst a knowledge of both high-level and low-level languages will be a distinct advantage. If you have designed at least one complete on-line system or have had project management responsibility then you will be considered for a more senior position. Ref: L/24/B (1469)

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It is required for two shift working in the College Computing Centre. A responsible and well-qualified person in charge with a minimum of 'O' level qualifications and English or previously some industrial background. Two to three years' operating experience is necessary.

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Germany to DM 100,000 p.a.
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COBOL Programmers

N.W.1 to £8,000
One of the recognised market leaders in the retail industry is currently wishing to reinforce its programming teams at all levels. Applicants with experience of IBM 370 and 3031 mainframes under DOS/VS and with at least two years Cobol in a commercial environment are required. More senior candidates will be expected to possess database knowledge with experience of DLI and involvement with systems analysis would be a distinct advantage. First class benefits package. **Contact: Brian Postles**

Analyst/Programmer

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A large international commercial company wishes to recruit an Analyst/Programmer to work on the development of several sophisticated real-time projects. Candidates should have at least three years experience in programming and design of commercial applications. Knowledge of communications, database or real-time would be an advantage. Excellent career opportunity. **Contact: Jim Baker**

Analyst/Programmer

Croydon c. £8,000
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Being the only data processing experienced employee, you must be aware of the implications of introducing data processing into a company and have experience of liaising with non-dp experienced personnel. You will have to be a self motivated individual and training will be given where necessary, including a trip to the parent company's data centre in Pennsylvania.

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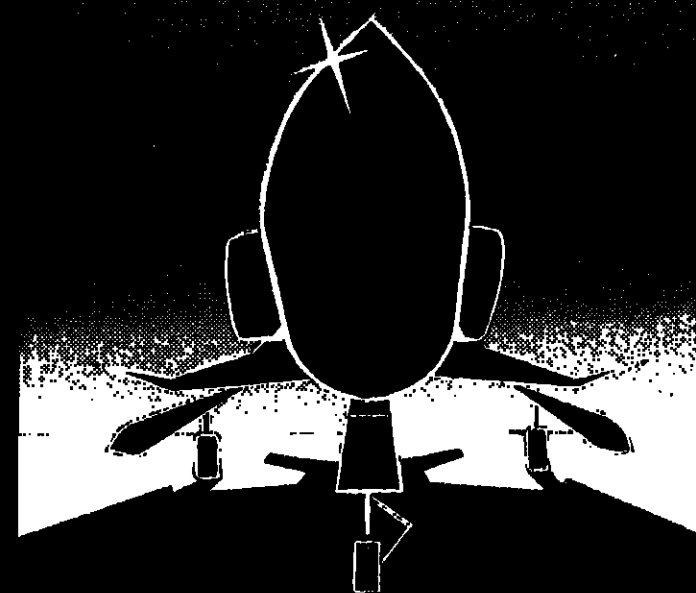


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Contact: Jim Baker

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Gloucestershire to £29,000 + reloc. etc.

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Contact: Brian Postles

Senior Systems Positions

£7,500-£9,500 + reloc. etc.

For the same installation as above, our client wishes to make two additional systems appointments, **SYSTEMS PROJECT LEADER** and a **SENIOR SYSTEMS ANALYST**.

The systems to be developed and designed initially are in the financial and manufacturing areas and will naturally incorporate Database and on-line techniques. Previous experience should cover similar application areas and candidates are expected to have seen at least one project through to implementation. As with the above positions, excellent corporate benefits apply.

Contact: Brian Postles

Technical Publications Manager

Rural Beds. to £10,000 + reloc.

A major computer manufacturing Company has established a technical publication group in Bedfordshire which is rapidly expanding in size, necessitating local management.

Candidates must be fully experienced, Senior Technical Authors with a solid background in the computer industry and a strong systems and software bias. The ability to manage staff, to edit and expedite projects, assess products and recruit staff will be the essential criteria of the appointee. Contact: Andy Wright

Systems Analysts

Close to Victoria Station £8,000 - £10,000 + bonus + profit share

A well established international service organisation currently has vacancies for Systems Analysts to assist with the development of commercial applications. Candidates should have 5 years in systems design and implementation, preferably with a COBOL programming background. Knowledge of on-line and database techniques would be an advantage. This is a real opportunity to work on a variety of projects with excellent career prospects. Contact: Margaret Stevens

Systems Programmer

Essex & European Travel £9,500

A large well known organisation operating on an international basis require additional expertise in their systems support area. The company have a 370/158 and Amdahl V5 using OS/MFT (converting to MVS) with IMS and TP system.

Candidates must have relevant computing experience with at least 2-3 years systems programming on a large OS type system. The activity of maintenance and trouble-shooting will provide plenty of interesting work that could involve trips to Germany and Spain.

Contact: Janet Chilvers

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(1518)

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(1506)

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The Computer and Software Services Department of a young and expanding company is currently involved in introducing major extensions to existing on-line systems covering Stock Control, Finance and Management Information applications. Their in-house computer system currently comprises a PDP 11/70 configuration and it is planned to install identical satellite systems in Northern Europe and the USA.

Ideally candidates should come from a commercial programming background and be familiar with on-line computer systems.

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Contact Barbara Ell quoting BL/11213.

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Our client is prepared to train programmers in analysis.

If you have two years commercial COBOL experience and have been educated to degree level you could join an expanding applications team. Extensive on-line development is underway in both the commercial and manufacturing areas.

Training and career opportunities will be provided by the professional organisation.

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COBOL PROGRAMMERS BRENTFORD c. £7,000

A leading engineering company based in Brentford, Middlesex, is currently seeking two COBOL programmers.

It is envisaged that the applicants will have 2-3 years experience of COBOL, gained in a commercial environment. Imminent projects include on-line order processing and an inventory management system.

Excellent career prospects await for the successful candidates with on-going formal training being provided where necessary.

Contact Peter Kennell quoting PK/11370.

SYSTEMS ANALYSTS AND SENIOR SYSTEMS ANALYSTS CITY £9.5K PLUS

Overseas Containers Limited is currently involved in major systems development utilising Teleprocessing, Data Base and Distributed Processing facilities on IBM equipment.

They are looking for Analysts with a good understanding of business processes and commercial awareness who will probably have supervisory experience.

Essential requirements are strong communication skills, in-depth experience of ascertaining users requirements and a technical background to support effective design of systems.

Contact Robin Lacey quoting RL/10174.

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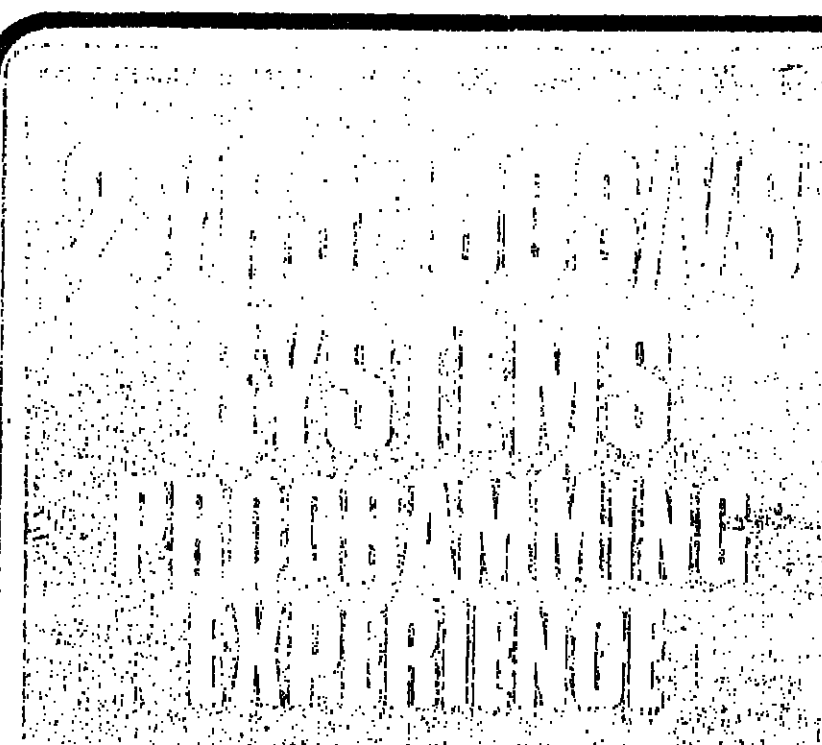
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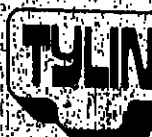
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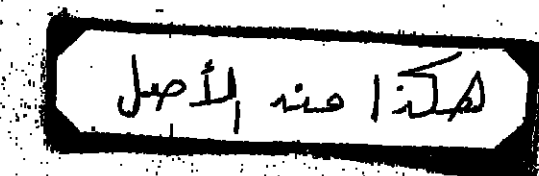
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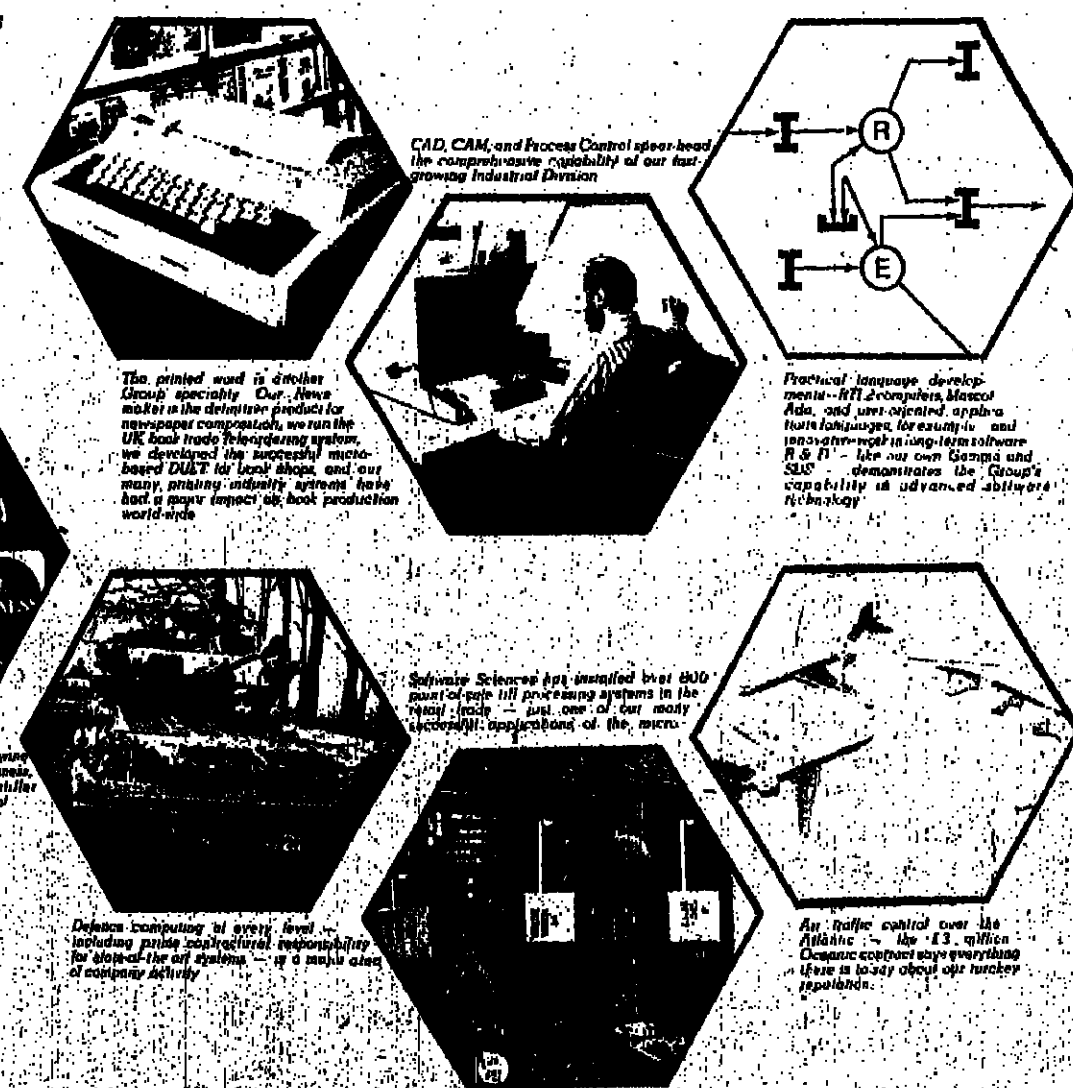
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IBM Banking - City - 9-12 months
IBM Progs - Cobol - DOR CICS - Berks - 6 months
Hewlett Packard Progs - Fortran - OR experience - 6 months

MIDLANDS

IBM Cobol Progs - Birmingham - 6 months
IBM Progs - PL/I - IMS/D5/DC - Birmingham - 1 year
DEC/RX 11 MACRO RTL2 - Birmingham - 3-6 months
IBM Cobol - IMS/DC - Staffordshire - 6 months
Honeywell L66 - Technical Systems Prog - Staffordshire - 6 months
ICL 2800 Cobol Progs/Fortran Progs - Staffordshire - 6 months

EMS

Phone: 021-454 7808 or 0782-623686, or
write to Recruitment Division
E.M.S. Data Centre
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Edgbaston
Birmingham B15 2TT

SYSTEMS PROGRAMMERS

£6500 - £9500

Dual 4 Mb 4341's

DOS/VS CICS/VS DL1, IOCF, SIPO

8140 on site and substantial network on order

Excellent training

Relocation assistance

Employees share scheme

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Applications are invited from candidates having at least one year's experience in an IBM Systems Programming role, to become involved with one of the most exciting developments in the country. Our client, a British company located in rural Cambridgeshire, wishes to recruit at both senior and junior levels good systems programmers who have been involved with both DOS and CICS and wish to further their careers.

Interested candidates are invited to contact Roger Pickin by telephone or in writing via the Harrogate office or evenings and weekends at Matlock (0629) 2609, quoting reference CW/8056, to arrange a confidential discussion.

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Harrogate HG1 1TS
Harrogate 88628

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Glasgow G2 6LY
041 226 4911

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24 HOUR ANSWERING SERVICE (0423) 55311

Multi-National Computer Manufacturer seeks Training Consultant to £8,000 Start + Car Surrey

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An opportunity not to be missed.

Training Consultants with this company are much more than just teachers; they are a closely-knit team of technical specialists who have proved their worth in the industry, have the capability of learning new disciplines, and are able to pass on that knowledge to both internal divisions and external users.

The company manufacture a wide range of mini computers, multi-functional terminals and word processing systems, and provide complete software support to all their systems. There is a constant flow of new hardware and software releases, and as this division is the first to receive them, there are always new things to learn regarding latest concepts and technology.

The person we are seeking could be either:

1. From a training background with a strong technical awareness gained in a commercial or educational DP environment

OR

2. An Assembler Programmer or Programmer Analyst who has a commercial background, the necessary communicative skills and the ability to learn quickly.

Benefits include a company car, relocation expenses, and the free use of all sports and social facilities, i.e. sports arena, tennis courts, swimming pool, sauna, etc.

If you are interested in this vacancy and wish to know more, contact Andy Mogg, Advising Consultant on 01-935 0671 (office hours), or 01-584 0604 (evenings and weekends).

London 01-935 0671 3 Mandeville Place, Wyndham Street, London W1M 8EG
Birmingham 021-236 3781 35-37 Great Charles Street, Queensway, Birmingham B3 3JY
Manchester 061-433 0427 Blackfriars House, The Paragon, Manchester M3 2JA
Bristol 010 322-440 7181/71 Avenue Louise 327/Bold 4, 1060 Brussels

SUB EDITOR/WRITER Computer Weekly COMPUTER JOURNALIST

required for Computer Weekly the UK's leading newspaper for this rapidly-developing market.

If you have had experience in the computer industry and want to broaden your knowledge and write for computer professionals, this could be the opening for you. Or you might be a journalist wishing to enter this exciting and rapidly-developing field.

Either way if you have a lively mind and the ability to write we would like to hear from you.

If you joined us, you would be joining a very experienced editorial team of 17 within IPC Business Press, the UK's largest publisher of journals. A comprehensive journalistic training is available. From the end of 1980, Computer Weekly will be published from new offices in Sutton.

Applications in confidence with cv's or requests for further details and application forms, to Dr. J. A. G. Thomas, Publishing Director, IPC Electrical-Electronic Press, Room 210, Dorset House, Stamford Street, London, SE1 8LU. Telephone 01-261 8400.

BARNET
(London Borough of)
HENDON COLLEGE OF FURTHER EDUCATION
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DEPARTMENT OF SCIENCE AND TECHNOLOGY
Post No. 10/80
LECTURER 1
COMPUTING
To teach a range of courses including GCE 'A' level, BEC/TEC National General, CG746, I.A.S. and short courses. A graduate with teaching experience, together with experience or knowledge of commercial/industrial computing will be preferred. The closing date of this post will be: June 27, 1980. Application forms and further particulars may be obtained by sending a large stamped self-addressed envelope to the Principal, Hendon College of Further Education, Williams Building, The Burroughs, Hendon, London NW4 4BT. (1980)

UNIVERSITY OF BIRMINGHAM
DATA PROCESSING MANAGER
£10,000 p.a. +

A vacancy exists for a Manager to assume responsibility for the administrative data processing unit. This is a senior position offering a challenge to male or female candidates with proven experience in the field.

Salary under review, but in excess of £10,000 per annum. Contributory superannuation scheme. Application forms should be addressed to the Senior Assistant Secretary, P.O. Box 363, Birmingham B15 2TT, from whom further particulars may also be obtained.

Closing date: June 30th, 1980.

Please quote ref. CWM (1854)

UMIST
PROGRAMMER

PER REF/85/BC. Applications are invited for a Programmer to join a team of three engaged on an important research and development contract involving microprocessors in communications. The contract is concerned with constructing a multiple channel system consisting of a microprocessor, a ROM, and a RAM. The Programmer will be responsible for the design and development of the software, including the operating system. The Programmer will also be responsible for the testing and debugging of the software. The Programmer should have a degree in computer science or a related field, and should have experience in the design and development of software for microprocessors. The Programmer should also have experience in the testing and debugging of software. The Programmer should be able to work independently and to communicate effectively with the team. The Programmer should be able to work to a tight deadline and to produce high quality work. The Programmer should be able to work in a team and to take responsibility for their own work. The Programmer should be able to work in a fast-paced environment and to be able to handle pressure. The Programmer should be able to work in a team and to take responsibility for their own work. The Programmer should be able to work in a fast-paced environment and to be able to handle pressure. The Programmer should be able to work in a team and to take responsibility for their own work. The Programmer should be able to work in a fast-paced environment and to be able to handle pressure.

Salary will be in the range £4,400-£5,750 per annum. Details of application forms and further particulars, including the application form, should be addressed to the Recruitment Officer, UMIST, P.O. Box 88, Manchester M60 1UD. Closing date is 28th June, 1980. (1823)

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£11,000 PACKAGE (not including overtime)

DML Computers Limited are delighted to announce they have recently been appointed sole distributors in Scotland and the North East of England for Storage Technology (STC) products.

DML have been in the IBM plug compatible field for the past four years and, as an extension of their "total sales and service" concept towards clients, they are now expanding their field engineering force.

The successful applicant will be maintaining IBM CPUs, STC Tapes, Disks, Add-on Memories, and Intel microprocessors etc. Although full product training is available, applicants must have proven experience in the large D.P. environment.

A salary package of circa £11,000 (excluding overtime) plus quality company car is offered to the candidate with the right experience, initiative and personality. This is an outstanding opportunity for an ambitious and responsible engineer looking to the future.

For further details, phone David Hicks, on 031 225 2711 or 031 226 5969 or send a written application to DML Computer Personnel Services, 11 Charlotte Square, Edinburgh EH2 4DR.

All applications will be treated in the strictest confidence. Please quote reference CP/106/E.

DML

(1488)

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ANALYST/PROGRAMMERS to project leader level. **SENIOR TECHNICAL PROGRAMMERS**. Experience of PDP 11/70, 34 machine using RSTS essential. **IMMEDIATE START**

LANCASHIRE
BUSINESS ANALYST, preferably with engineering background. Must have experience of machine shop scheduling and production control systems. **START MID-JULY. LONG CONTRACT**

MIDLANDS
ANALYST/PROGRAMMER, ICL background. Preferably with experience of the Lowndes-Jones general ledger package. **MID-JUNE START**

SYSTEMS PROGRAMMER. Must have experience of the following OS/VS operating systems: CICS ref. 1.4 onwards, IBM/VSAM. **IMMEDIATE START. LONG CONTRACT**

PL/1 PROGRAMMER. Must have extensive PL/1 background. **END OF JULY START**

RTL 2 SPECIALIST. Must have extensive RTL 2 background. **END OF OCTOBER START**

Project Recruitment Limited
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DAVE WALLIS

01RR

Software Support Programmers

are required at Culham Laboratory, the UKAEA centre for fusion research and the site of the large European fusion experiment, to work on a recently installed ICL 2970 (which is a dual processor system linked to two PRIME 550s) in the following areas:

• Developing the user image and advisory services to experimentalists
• Supporting COBOL and database/DMS applications
• Applicants should have a degree or equivalent professional qualifications
• Experience of maintaining and developing operating systems software would be an advantage. We would particularly welcome applications from graduates who want to work on advanced computer systems and their applications in a stimulating and challenging scientific environment.
• Appointments will be made in the Scientific Officer grade. Salaries in the range £3,345-£5,375 at present under review.
• For an application form contact Nicky Watts.

Culham Laboratory
Personnel Department, Culham Laboratory, Abingdon, Oxford, OX14 3DB
Telephone 0235 21800
Please include reference CW/484

BILLION \$ BRAINS...FOR SALES SUPPORT

Database Consultant

To £15,000 + Car

Telecommunications Analysts and Consultants

£10,000 - £15,000 + Car

Tremendous growth has marked the performance of our client, particularly in the last five years. A multi-national company, specialising in both data processing and word processing equipment, sales have rocketed and the company is poised for its first \$1 billion year in 1981. The equipment and the majority of the management, sales and technical personnel are already involved, but the company still needs a few specialist "Billion \$ Brains" to help achieve the magic turnover.

Database Consultant £15,000 + Car

We need a technically competent person, with the personality and flair to make presentations, to users, in pre-sales situations and in house. The company already provides a DB package and is soon to release a relational database system. Experience of large mainframes, with virtual storage techniques and a programming background in languages such as COBOL, RPGII or BASIC is required. Some travel to the U.S.A. will probably be required during the development phase of the new relational database system.

Telecommunications Consultants To £15,000 + Car

Telecommunications Analysts £10-£12,000 + Car

Two people are required - one in a pre and post field sales support role, the other in a Head Office problem solving role. The field sales support position will require an in-depth knowledge of teleprocessing systems, particularly in conversation with IBM hardware and software. There will be a great deal of customer contact and previous experience with a manufacturer would be advantageous.

The Head Office consultant will have excellent technical experience and will enjoy a problem solving role, dealing with enquiries from the field. Both positions require an in-depth telecommunications and programming background.

Please telephone (24 hour answer service) or write to apply. Quote Ref. CW 135-J.

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Can You Teach Computer Programming?

At our Borehamwood establishment we are heavily involved in the design, development and manufacture of some of the world's most sophisticated electronic systems for a variety of military and civil applications. These systems make extensive use of signal processing techniques involving microprocessors, mini and micro-computers.

Programming these systems is a challenging task and our programmers have to be given the finest possible training. We now require, within our Airborne Software Division, a Software Lecturer to join a small team responsible for providing new courses in programming and computer techniques particularly, but not exclusively, in the area of microprocessors. This will involve every stage from writing the syllabus to preparing and delivering the lectures. The students will consist of small groups including programmers, engineers and others, many of whom may be new to programming.

Applicants should already have considerable practical programming experience in an industrial environment and teaching/lecturing experience would be an advantage.

The appointment, which is open to both men and women, carries a highly competitive salary and benefits including assistance with relocation where appropriate.

Assistance with local authority housing could in certain circumstances be made available.

Phone Chris Hill on 01-953 2030 extn 3449 or write to him at Marconi Avionics Limited, Elstree Way, Borehamwood, Herts. Please quote reference MA80717.

MARCONI AVIONICS
AEG-Merz Electronics Company

(1830)

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Plus 2 litre car plus other benefits

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PROGRAMMERS FOR ENGINEERING AND SCIENCE

We are a specialist agency serving the needs of the engineering and science industries. We are currently seeking experienced programmers for a variety of positions. The successful candidate will be responsible for the design and development of software for engineering and science applications. The candidate should have a degree in computer science or a related field, and should have experience in the design and development of software for engineering and science applications. The candidate should also have experience in the testing and debugging of software. The candidate should be able to work independently and to communicate effectively with the team. The candidate should be able to work to a tight deadline and to produce high quality work. The candidate should be able to work in a team and to take responsibility for their own work. The candidate should be able to work in a fast-paced environment and to be able to handle pressure. The candidate should be able to work in a team and to take responsibility for their own work. The candidate should be able to work in a fast-paced environment and to be able to handle pressure.

SEALY HARBOR ENGINEERING, ALABAMA
Specialist Computer Recruitment Ltd

Leeds

Leeds University
The University of Leeds is seeking applications for a Lecturer in the Department of Computer Science. The successful candidate will be responsible for the design and development of software for engineering and science applications. The candidate should have a degree in computer science or a related field, and should have experience in the design and development of software for engineering and science applications. The candidate should also have experience in the testing and debugging of software. The candidate should be able to work independently and to communicate effectively with the team. The candidate should be able to work to a tight deadline and to produce high quality work. The candidate should be able to work in a team and to take responsibility for their own work. The candidate should be able to work in a fast-paced environment and to be able to handle pressure. The candidate should be able to work in a team and to take responsibility for their own work. The candidate should be able to work in a fast-paced environment and to be able to handle pressure.

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Format Telecommunications Sales Limited is a small but leading British Manufacturer of Computerised Message Switching Systems.

With the ever increasing demand for distributed processing on a national and international scale Format have, since 1973, become a well-known and respected supplier of real-time computerised communications systems.

For the right person, they can offer a young and dynamic environment full of job opportunities including that of Management and marketing disciplines. Format can attend to the needs of most ambitious people while offering the stability and security of sound financial backing.

Marketing and selling their sophisticated systems demands a good understanding of communications networks as well as applications knowledge. Your negotiations skills should be of Board level status while it is imperative that you recognise the contribution people make at all levels. Above all, you must be a professional person, sales orientated and with a sound technical background.

Here is a chance to join a Company that develops products as well as people where you will have the chance to steer the Company into new areas. A successful applicant could go to Director level within this flexible and go-ahead Company.

Don't miss this career opportunity. For an immediate and confidential interview contact:
SIMON LEYER, Advising Consultant, ON 01-985 0671 (24 hour answering service) OR 021-420 1574 (evenings & weekends)

Your application will be treated in the strictest confidence.
Please write to me if you prefer.

Specialist Computer Recruitment Ltd
London 01-935 0871, 3 Mandeville Place, Wigmore Street, London W1M 8LB
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MYRIAD

BUILD THE SYSTEMS OF THE FUTURE

Based in HAMMERSMITH, W6, our client is a major international petrochemical and civil-engineering organisation with projects world-wide. Due to the increasing workload which the company is taking-on considerable additional demands are being placed upon the international data-processing departments and this has led to expansion within the London systems and programmable group.

ANALYST/PROGRAMMERS
£6,500-£8,500

Experienced analyst/programmers or programmers wishing to progress into analysis will become involved in the development of a range of on-line systems including project management and materials control applications. A minimum of 18 months COBOL is necessary coupled with a willingness to learn and apply new techniques.

Systems development is based on dual Univac 1180 mainframes at the main data-centre which supports data-base and on-line links to users around the world. Additionally mini-computers with local and on-line capability are used for distributed processing. As the company continues to build the cities and refineries of the future, so this is an opportunity to work on the sophisticated computer systems which will help assure its continued success.

SNR ANALYST/
PROGRAMMERS
£8,500-£10,500

The senior analyst/programmer will function primarily in the analysis role although a strong COBOL background is a necessity. The person appointed should demonstrate the ability to control projects and liaise with users to take systems from inception to implementation. The position requires at least four years' relevant systems and programming experience.

TIMESHARING
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£9,000-£11,500

This role entails providing a two-fold service to users in liaison with the company's own data centre and external timeshare bureaux. Responsibilities include the assessment of new products, providing consultancy to users and design of special systems. A strong background as a timeshare user and solid high level programming experience is essential.

Ref: SW4/1206

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(1898)

REAL TIME
UP TO £11,500+

Digital Applications International is an established systems house with a reputation for excellence in the application of mini and micro computers to real time processes.

We need experienced, versatile people who can design and configure mini computer systems, take on occasional consultancy assignments and run project teams. Openings also exist for systems analysts and programmers with a minimum of 2 years real time mini project experience.

We are working on plant process control and monitoring for applications in North Sea oil and chemical/petro-chemical industries, laboratory automation, mechanical handling, medical systems, management information systems.

The projects are both in the UK and abroad. The work is demanding and as such the rewards are high. Besides a competitive salary and profit sharing, benefits include relocation expenses, air work allowance and PPF medical cover.

Please reply to any of our offices:

Keith Lewis
DAI Ltd
201 Newbury
London W11 1AB
Tel: 01-222 5181

Parvinder Dhillon
DAI Ltd
201 Newbury
London W11 1AB
Tel: 01-222 5181

Roy Sedgwick
DAI Ltd
201 Newbury
London W11 1AB
Tel: 01-222 5181

DAI

UNIVERSITY OF BRISTOL
Department of Computer Science
RESEARCH
ASSISTANT
NUMERICAL ALGORITHMS AND
VECTOR PROCESORS

Applications are invited for a second postgraduate Research Assistant to join a project on the development of numerical algorithms on vector processors. Current work is concerned with producing algorithms and practical software for ordinary and partial differential equations arising from problems in fluid mechanics. The person appointed will share in this work, but we are looking for someone with interests in, at least, one of the more fundamental areas: algorithm design, computer architecture, programming language design, or programming language design. The post is supported by the S.S.C.

Candidates should have considerable experience in computing and a fair knowledge of numerical methods. A computer science background is highly desirable.

The appointment is for two years, commencing in October or November 1980. Salary on the Research Assistant 1A scale, ranging from £5,000-£5,500 depending on experience.

Further information may be obtained from Dr. J. D. G. Evans, Head of Department of Computer Science, University of Bristol, 308 Woodland Road, Bristol BS8 1TL. Tel: 0274 308411. Applications should be submitted as soon as possible, and not later than 22nd June, 1980.

(1848)

Telecommunications
Project Engineers

We should like to hear from you if you have experience of telecommunications networks and an extensive background knowledge in the areas of Post Office data services, Private modems, data network configuration and network control systems.

Preferably candidates will have gained an H.N.C. or equivalent City & Guilds qualifications but consideration will be given to applicants with the relevant experience in the Services or with Suppliers or the Post Office. We are looking for people who are self motivated, able to work with minimal supervision and prepared to travel extensively in the U.K.

We offer an attractive salary and the usual range of benefits associated with a large international organisation. Please write giving details of qualifications and experience to Miss J. E. Morris, Personnel Department, Philips Industries, 8 Arundel Street, London, WC2R 3DT.



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PROGRAMMERS OF PROG/ANALYSTS
C. £5,000-£8,500

Knowledge of FORTRAN is essential with a degree of Maths or Physics. The best training considered.

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C. £5,000-£8,500
Large service company requires a Systems Analyst with 2 years' experience of design and implementation of data processing systems in an industrial environment.

PROGRAMMER/ANALYST
C. £7,000-£10,000
Large service company requires a Programmer/Analyst with 2 years' experience of design and implementation of data processing systems in an industrial environment.

PROJECTS MANAGER
C. £10,000-£12,000
Large service company requires a Projects Manager with 2 years' experience of design and implementation of data processing systems in an industrial environment.

PROGRAMMER
C. £5,000-£8,500
Large service company requires a Programmer with 2 years' experience of design and implementation of data processing systems in an industrial environment.

AMES
PERSONNELUniversity of London Computer Centre
Programmer/Analyst
in User Support

The University of London Computer Centre is a major centre for computer science research and provides a computer service to the University of London and to Universities in the South East and West of England. The Centre is currently equipped with Control Data 7600, 8600, 6400 and CYBER72 computers and supports a large communications network of batch and keyboard terminals.

An exciting development programme is planned which will include substantial replacement of existing equipment and the development of new software.

The User Support Group is the main interface between users and the computing services, and provides advice, documentation and user education services, computer graphics and applications packages and libraries.

A Programmer/Analyst is required to join the team engaged in the provision of the Advisory, Documentation and User Education Services. Applicants should preferably be graduates or postgraduates with a least interest in the provision of user services, and have the ability to communicate clearly.

Salary will be commensurate with age, relevant qualifications and experience on scales £4,402 to £6,740 (main) and £2,740 (London Allowance).

Full details of the position and application form are available from the Personnel Secretary, UCC, 30 Gower Street, London, WC1N 3BU. Telephone 01-405 3400. Applications close June 28th, 1980.

Computer Planning
and Development
Manager

CARDIFF £11000

Wales Gas is responsible for natural gas distribution and marketing throughout Wales and, as a large and successful business, requires a full range of computer support activities. These are currently based on a two-processor central mainframe which handles batch and on-line (including real time) systems through an extensive communications network. A move to a new mainframe in new accommodation is intended within three years.

In support of these operations and developments, Wales Gas wishes to appoint a Computer Planning and Development Manager. Reporting to the Computer Manager, he or she will be responsible for planning and development, including hardware and operating software requirements, and for software support services, data management, and computer education and training.

Applicants should have an appropriate degree or be corporate members of an appropriate professional body. Extensive technical and management experience in computing is essential.

The salary range is £9,920-£11,360 (review date July, 1980) and we offer the usual benefits of a large organisation. Where appropriate, removal assistance will be given.

Please telephone Mrs. Mary Williams for an application form on Cardiff 0222 33131, extension 3201.

WALES GAS

(1627)

NETWORK CONTROL
ASSISTANT

From £6,690 p.a. CROYDON

Due to the expansion of our on-line Computer Systems we have created this new post.

You will be responsible for the day-to-day operation of the SEGAS teleprocessing network which consists of some 700 terminals connected to IBM 3032 and Amdehl main frames.

Your duties will include testing and fault diagnosis, repair work and liaising with users during down time periods; as well as preparing regular management reports on a variety of subjects including network usage, equipment performance and reliability.

You should have experience of operating IBM machines in a CICS/VS/VTAM environment and should have a basic understanding of the technology of teleprocessing.

You will be required to work on alternating shift system covering the period 7 a.m. to 7 p.m.

Write giving full details, within 7 days, and quoting Ref: C.6488 to the Personnel Manager, SOUTH EASTERN GAS, Sages House, Katherine Street, Croydon CR9 1JU.

People come first with
SOUTH EASTERN GAS

(1860)

WEST MIDLANDS PASSENGER TRANSPORT EXECUTIVE
Finance DepartmentGROUP AUDITOR
(COMPUTER AND TECHNICAL)
£7,147-£8,004

The Executive are currently undertaking an extensive programme of systems development using the West Midlands County Council's I.C.I. 2600 Series Computer. Access to the system will be by terminals, one of which will be available for internal audit.

The holder of this post will be expected to participate in the development of systems with particular emphasis on the specification of controls, and will be responsible for the development of the Executive's computer audit activities as defined in the C.I.P.F.A. statement on computer audit.

It is anticipated that the successful applicant will be either:

1. A recently-qualified accountant with some audit experience who wishes to gain first-hand experience on computer auditing and systems development; or

2. A systems analyst/programmer with experience of I.C.I. hardware who wishes to broaden his/her knowledge.

The appropriate training will be given to the successful applicant. Conditions of service include an apartment car users allowance, a car loan scheme and assistance with removal expenses in appropriate circumstances.

Prospective applicants requiring further information may contact the Internal Audit Committee, Miss Mary Jones, Birmingham 813801. Application forms are available from West Midlands Passenger Transport Executive, 10 Summer Lane, Birmingham B15 3SD. Tel: 021-222 5181, renewable by June 27, 1980.

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Our client is a market leader in the fast growing market of interactive computer graphics. UK turnover is well into seven figures, yet company revenues trebled in the last year. Their range of high resolution graphics terminals and related software provides a cost/performance which clearly outpaces all competitors.

Continuing success has brought about the need for an experienced senior sales executive with good experience of the computer industry to take responsibility for selling the company's complete product range to users and distributors throughout the

UNITED KINGDOM and EUROPE

The job is based in the NORTH HOME COUNTIES but will necessitate travel in Europe for approximately one week per month. A working knowledge of French is desirable but not essential.

Total income will be up to

£14/16,000 plus COMPANY CAR

Please supply complete career details to Jaki Whyte or Alan Williams quoting reference DTA/006.

Tel: 01-734 9776

Anytime service after 6pm and weekends 01-437 8228. TRAINING, ASSESSMENT, RESEARCH, RECRUITMENT

MIDLAND
RECRUITMENT
FEATURE

Advertisers are reminded that the next Computer Weekly area feature will be published on June 19 and will highlight career opportunities in the Midlands.

Space reservations should be made as soon as possible to:

Vic Sheret - Birmingham - 021-356 4938

Julie Hannaford - London - 01-261 8097

Copy Deadline: PM Friday before

COMPUTER WEEKLY
THE INDUSTRY'S WIDEST READ AND MOST REQUESTED NEWSPAPERLOTHIAN REGIONAL
COUNCIL
Department of EducationCOMPUTER
PROGRAMMER

The holder of this post will be responsible for the day-to-day operation of the SEGAS teleprocessing network which consists of some 700 terminals connected to IBM 3032 and Amdehl main frames.

Your duties will include testing and fault diagnosis, repair work and liaising with users during down time periods; as well as preparing regular management reports on a variety of subjects including network usage, equipment performance and reliability.

You should have experience of operating IBM machines in a CICS/VS/VTAM environment and should have a basic understanding of the technology of teleprocessing.

You will be required to work on alternating shift system covering the period 7 a.m. to 7 p.m.

Write giving full details, within 7 days, and quoting Ref: C.6488 to the Personnel Manager, SOUTH EASTERN GAS, Sages House, Katherine Street, Croydon CR9 1JU.

CROYDON COLLEGE

Farnfield, Croydon CR9 1BX

Applications are invited from suitably qualified persons for the following post, dates to commence 1st September, 1980.

COMPUTER STUDIES SECTION
LECTURER IN COMPUTER STUDIES

A Lecturer is required to teach Computer Studies to students in further education. The post holder should have a minimum of 3 years' experience in the computer industry, experience of COBOL and/or teaching is desirable. This is an opportunity to join a well established section, capable of providing a high standard of education.

The salary for the above post is in accordance with the current Borough of Croydon Education Authority, and is at present:

£7,147-£8,004 (Main Scale) and £2,740 (London Allowance).

Further details and application form may be obtained from the Personnel Secretary, Croydon College, Farnfield, Croydon CR9 1BX. Tel: 0203 222 5181, renewable by June 27, 1980.

THE SALES BIT

In the first part of this article on feasibility studies, published before the editorial content of Computer Weekly was interrupted (CW, April 10), I told a story against myself of how I once got carried away with the apparent individual needs of senior management in a large company where I carried out a feasibility study and almost proposed a computer system costing many times more than the maximum a client was prepared to pay or, more to the point, had financial approval for spending. That set the scene for discussing the subject. Now read on.

Don't lose a sale
at study stage

FEASIBILITY studies (some people call them sales surveys) are an established part of most capital goods and high technology selling. In many cases the sale can be lost by getting it wrong at this stage.

What can go wrong? Well, a lot of things, but the biggest risk is a total loss of professional credibility by miscalculating the specification.

Let's look at a few basic guidelines for feasibility studies.

● The salesman must ensure that he is investigating the right problem. That's not always as straightforward as it might first appear. It is easy accidentally to omit essential elements or take into account details which are irrelevant.

Once the salesman believes he has a complete grasp of the problem to be investigated he should confirm with the client that his understanding is correct. If competition is involved, there is no harm in confirming that their activity is also confined to the same area.

● There are many ways in which essential facts can be forgotten, overlooked or never asked for in the first place. Nothing should be left to memory; everything should be assumed; everything should be written down. The use of survey questionnaires is an excellent discipline where all the basic questions related to a given application or specific piece of equipment are stated from a basis of previous experience. All the salesman has to do is concentrate on the "specials".

● The salesman should not limit his input of information to those facts given to him by his primary contact. He should go to where the problem actually resides and look at that for himself in its entirety.

● Often the people with the least authority have most of the responsibility. Unfair but true! When discussing the implications of any problem it is essential to speak to every person and department involved with the existing problem and affected by the anticipated solution. There is also the added benefit of "selling" the system or product to those people who will ultimately have to use it—thus providing some protection against possible "luddite" activity at a later date.

● It is easy for the salesman to turn his product into a "solution" looking for a problem by way of preconceived ideas related to the assumed limitations of his product or the way in which it must be used.

● He should be open-minded and always listen most carefully to everyone he comes across during the feasibility study.

● It is essential for the salesman to begin a feasibility study with an appreciation of how much the client is prepared to spend. There is no point in setting out if budgetary limitations are going to make the solution impractical on the spot.

On the other hand, a "blank cheque" situation still leaves the onus on the salesman to propose a product or service which is reasonable in terms of the problem to be solved.

● There are often situations which provide opportunities to expand the solution beyond the area of investigation or cost initially envisaged. Don't ever make the mistake of embracing such situations without prior approval from the decision maker.

● More often than not a feasibility study involves volumes of some kind. It could relate to workload, materials, information, process, power and so on.

It is important that the salesman clearly identifies the considerable differential implied by such words as actual, estimated, potential, possible, probable, forecasted, anticipated, planned and assumed when related to the word volume.

One can sensibly design a system or piece of equipment only on facts. Whether such information is a proven reality or an estimation on which the client is prepared to commit himself is irrelevant.

However, in order to avoid any misunderstandings or discrepancies at a later date it is essential that the salesman, prior to configuring his solution, writes a formal letter to the decision maker stating his understanding of the volumes concerned, and seeking formal approval to proceed with specifying the equipment, service or whatever, based on such declared information.

● One type of sales prospect to be aware of is the one who doesn't really want to buy anything but is interested in mounting an investigation into the nature of his problem and the range of possible solutions.

If the salesman suspects this, he should get the employer to agree to a charge being proposed at regular intervals, with a commitment to subsidise such charges from any order resulting from the survey.

The feasibility study is a crucial stage of many sales. Let's face it, it's difficult enough to win the order, so why increase the odds by proposing the wrong solution?

THADER

Puzzle Answer

THE complete roster was:
1234, 1243, 1423, 4123, 4132,
1432, 1342, 1324, 3124, 3142,
3412, 4312, 4321, 3421, 3241,
3214, 2314, 2341, 2431, 4231,
4213, 2413, 2143, 2134.

